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THE VIDEOTEX/COMPUTER MAGAZINE

Interactive Gaming

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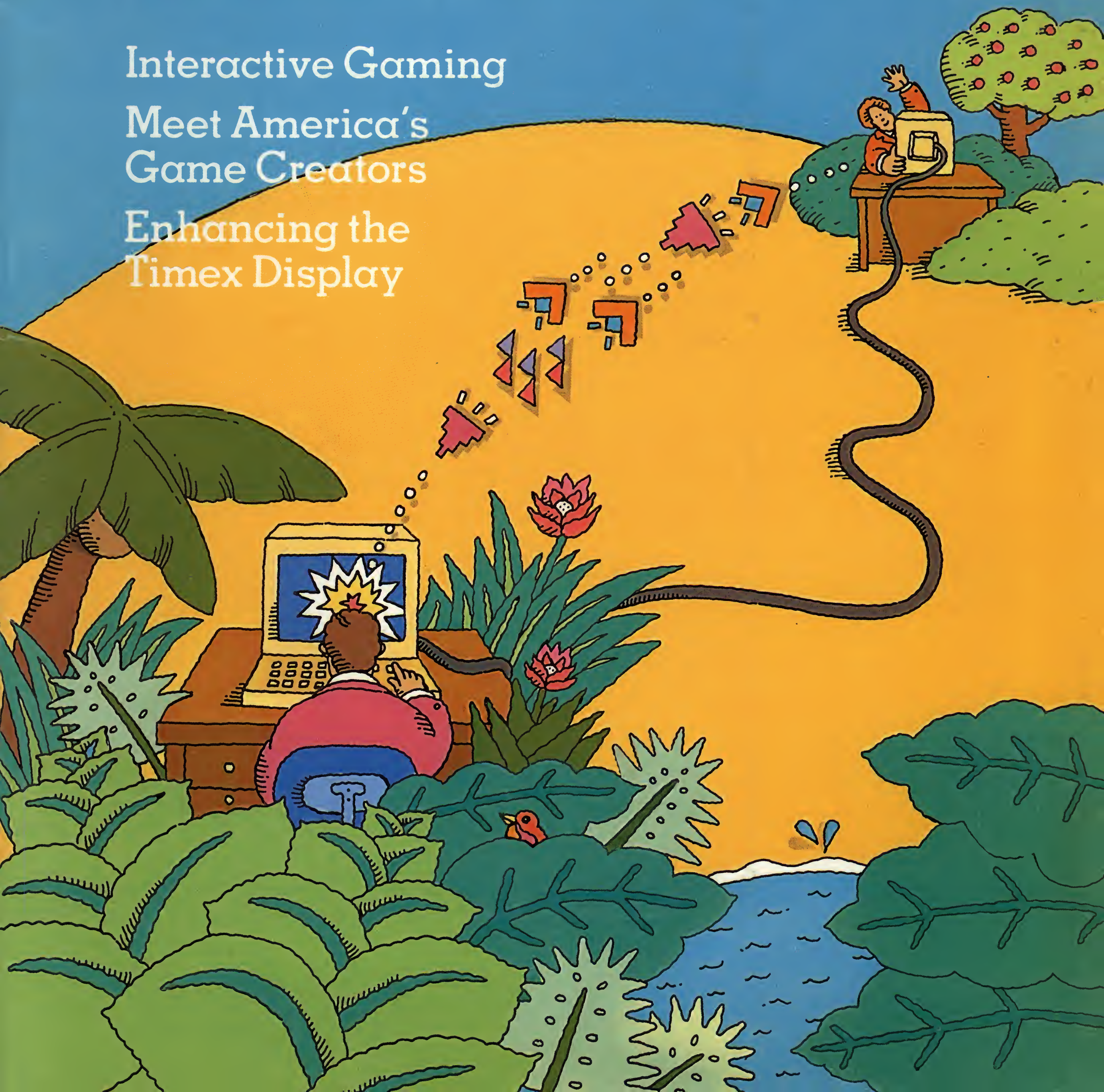

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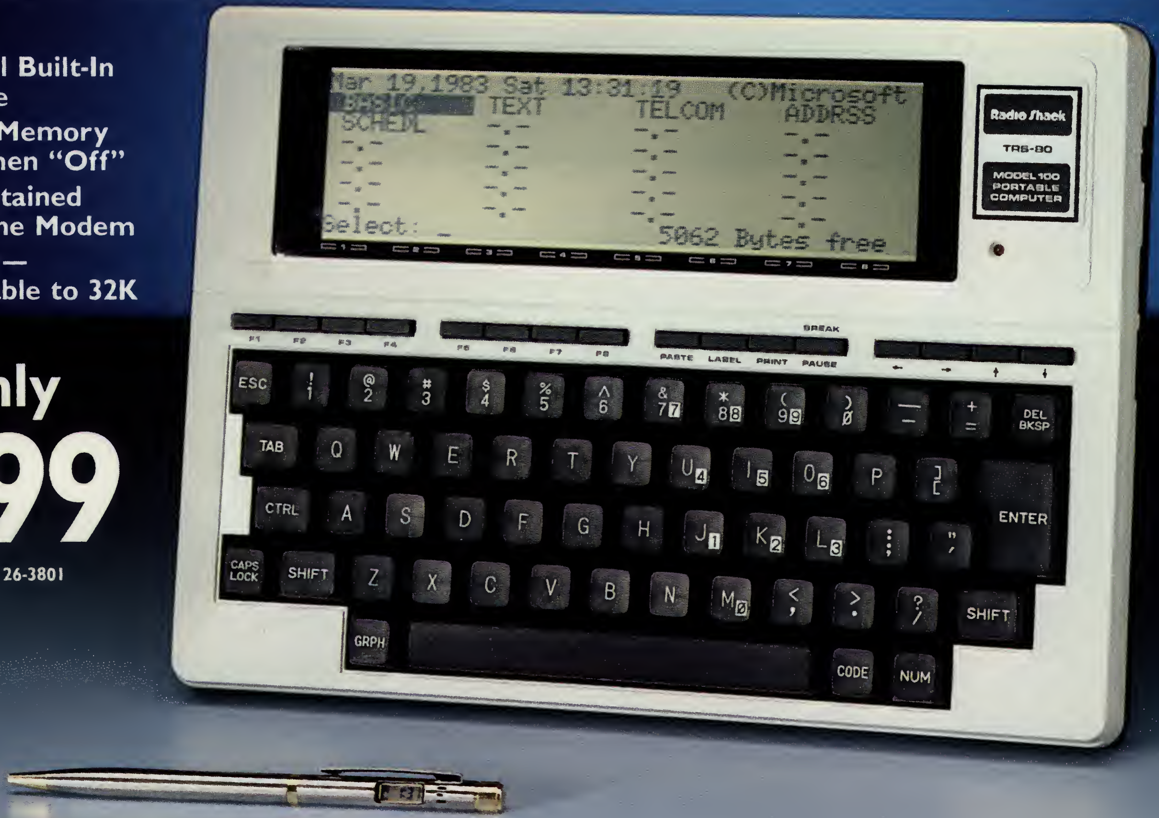

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Mar 19,1983 Sat 13:31:19 (C)Microsoft
BASIC      TEXT      TELCOM    ADDRSS
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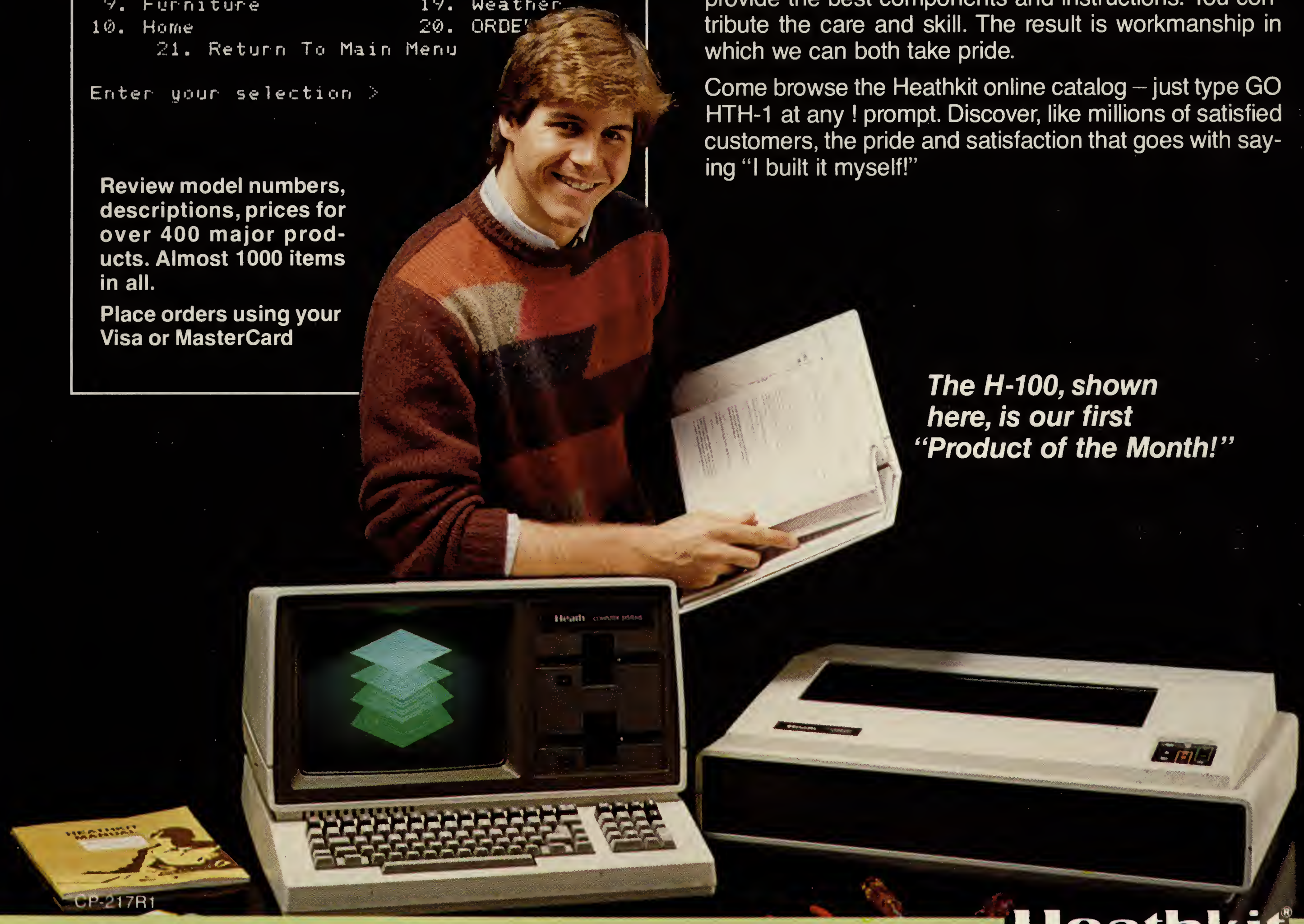

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THE VIDEOTEX\COMPUTER MAGAZINE

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A world where human players scattered all over the nation can pit skill and intellect against one another in an ongoing computer game might seem like a world of the future. Interactive games are here today, and more exciting developments are on the way.

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COVER

"Interactive Games"
This month TODAY takes a look at the wonderful world of computer games with a special eye on the exciting interactive games at CompuServe. Illustration by Mary Lynn Blasutta.

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Letters

Please address your letters to CompuServe electronic mail, ID number 70003, 1372 or to: Editor, TODAY magazine, 5000 Arlington Centre Blvd., PO Box 20212, Columbus, OH 43220. TODAY reserves the right to edit letters for length, content and clarity.

Educational Computing

Although I have been an educator for 12 years, I am new to the world of computers. Therefore, I found the article, "Educational Computing," (March) to be extremely helpful and interesting. I particularly found the section on the language controversy to be of assistance.

However, I believe there was a minor error in the article. On page 20, BASIC was decoded as "Beginners' All-purpose Symbolic Language Code." It should read, "... Instruction Code."

Mari M. Castrovella
Yonkers, NY

I am a teacher in a school district that has recently purchased several microcomputers. I am struggling with many of the same problems that were highlighted in the article "Educational Computing." I have read many articles on computers and education in an attempt to bring myself up to date on the subject. No article has served me better than the one in TODAY magazine. It is the most thorough and informative report on educational computing I have read.

Lynn Spicer
Houston, Texas

Data Communications

In the past several months, TODAY has presented a rosy view of the future to come; a future based upon heavy home use of information utilities. However, no mention has been made of the fact that the era of using modems to send bits at slow speed (face it, 1200 baud is slow and 300 baud isn't worth mentioning) over the telephone network is nearing its end.

As flat-rate local telephone service ceases to be available in most of the country, alternatives have to be developed. What work has been done in this area?

One solution that is highly-touted, but as yet untapped, is the concept of using the cable TV utilities as carriers for data. The suitability of this medium is obvious: Cable has high bandwidth and is appearing in more homes. Clearly, data on coax at megabaud rates makes better technical and economic sense than encoding bits into audio over a pair of copper wires.

As a computer professional, I make extensive use of the telephone network for data. I already have the "home office" that is presented as an entity of the future. I've already recognized the urgency of converting to different medium for data communications. It's a shame that even in the Silicon Valley the cable utilities still think in terms of providing TV stations 3,000 miles away instead of more long-term applications such as data.

Mark Crispin
Mountain View, Calif.

Electronic Bounce Back

Instructions/Tips

Step 1
To enter the Electronic Bounce Back program, choose item 11, User Information, or GO EBB.

Step 2
After the introductory information, you will be prompted for your name and mailing address.

Step 3
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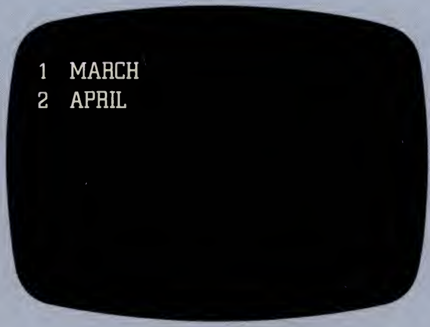

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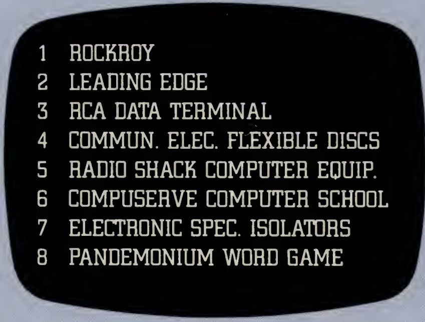
1  MARCH
2  APRIL
```

Example:

After entering the issue of your choice, a list of advertisers will appear.



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1  ROCKROY
2  LEADING EDGE
3  RCA DATA TERMINAL
4  COMMUN. ELEC. FLEXIBLE DISCS
5  RADIO SHACK COMPUTER EQUIP.
6  COMPUSERVE COMPUTER SCHOOL
7  ELECTRONIC SPEC. ISOLATORS
8  PANDEMONIUM WORD GAME
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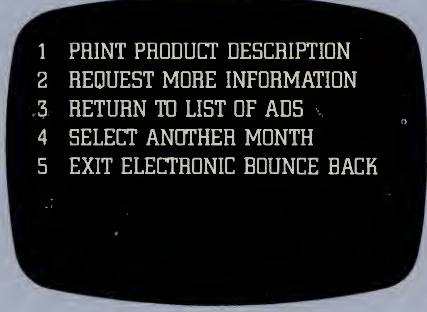
Example:

Step 4
After choosing an advertiser, you will be shown the list of following options:



```
1  PRINT PRODUCT DESCRIPTION
2  REQUEST MORE INFORMATION
3  RETURN TO LIST OF ADS
4  SELECT ANOTHER MONTH
5  EXIT ELECTRONIC BOUNCE BACK
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Step 5a
Selection 1 displays brief product descriptions.

Step 5b
Selection 2 sends your name, address and ID number to the selected advertiser. You will also be presented with a Comment option. You will be given three lines to make your request to the advertiser.

Step 6
After completing your request, the option menu (step 4) will be redisplayed.

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Dear Reader,

THE THINKING MAN'S GAME

A lot of people purchase a personal computer with noble intentions. "Office automation," they say. "For my kid," they tell the salesman. "I'm going to learn to program." Whatever. The plain truth is that they play games.

To be sure, there is nothing wrong with playing games. Some computer games even require a certain amount of intelligence and skill (besides an athletic wrist) to play. The most important consideration is that games provide a "safe," non-threatening introduction to the world of personal computing. Beyond the fact that the computer game is just plain fun, its role as an usher to more serious forms of computing should cause defenders of micro sports to brook no criticism.

The only lackluster facet of computer play is the absence of real human competition — a matter that makes games worth playing. It's possible to conquer and grow tired of some of the most complicated computer games, even ones that place two competitors at the end of joysticks. Such a fate is unlikely for even the simplest games that call for two human players, a modicum of intelligence and little paraphernalia.

Reintroduction of the human element is what makes interactive computer games so exciting. It combines the novelty of computer play with the interaction of two or more people who are actually doing some *thinking*. Our cover story on CompuServe's interactive games (page 8) introduces us to the thinking man's computer games.

While CompuServe's interactive game offerings are all of the tabular "space war" variety, the potential for this game technology holds much promise. Addition of graphics and sound to interactive gaming will increase the appeal and unfold new uses of this technology beyond the boundaries of play.

Doug G. Branstetter

Douglas G. Branstetter
Editor

TODAY magazine May, 1983
Volume 2 Number 6

Published by CompuServe Incorporated
an H&R Block Company

Editorial and Advertising Offices
5000 Arlington Centre Blvd.
P.O. Box 20212
Columbus, Ohio 43220
(614) 457-8600

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A LOOK AT WEST GERMAN VIDEOTEX

Last month we began our journey through the world of videotex in the place it was developed — Great Britain. We traced videotex from its invention in the early 1970s as an attempt to rescue British picturephone research. The new medium, based on the easy operation of computers by the general public, salvaged picturephone video display units (VDUs), using them to display information transmitted over phone lines from a central computer. With videotex the user keyed simple commands or made menu selections over a simple keypad.

From this development in the early 1970s by Sam Fedida and a small group of dedicated young engineers came the medium that will change our lives. As it evolved, videotex, or viewdata as it's called in Great Britain, took on many evolutionary steps. The public service to have grown out of this development work is Prestel, the first commercial videotex service.

While Prestel gained distinction as the first commercial service, it still lacked one vital element — the ability to perform transactional operations on a real-time basis with remote computers. What was possible was simple electronic messaging: Filling in a name and address for a catalog to be sent, or ordering goods or services over the system, and paying for them via a credit card. The card number can be entered into the system, and the order and payment are recorded. What a user couldn't do was pay for goods or services with automatic funds transfer from a bank account to the source of the goods or services. Such a system would work if one had unlimited credit, but not many of us do! This was one problem the British could not directly solve, though they did have a hand in the process.

The problem was eventually solved by the development of "gateway" technology — the result of several ideas coming together. The main ingredient here was the X.25 switch developed for telecom packet switching. Development of the gateway was largely the result of work by the Deutsche Bundesposte, or the West German Post Office, which has implemented videotex in West Germany through a pilot service known as Bildschirmtext.

The West German Post Office had implemented a packet switching service within the country called Datex-P. The X-25 switch, used for connecting the data packets from one switching center to the next, could also be used to interconnect computers with each other in basically the same format. Thus, data could be packed by a remote computer and sent to the videotex host computer for distribution to the user. Similarly, data entered by the user could be switched back from the host computer to the remote computer.

Levels of security had to be created, all in the same software package that allowed the bank computer to shake hands and communicate with the videotex host computer.

This work was begun in the late 1970s, when Bildschirmtext was first initiated as a pilot service in the cities of Berlin and Dusselforf. The trial has encompassed some 6,000 users, including both residential and business users. The system was originally specified for GEC computers, the same on which Prestel was developed in Britain. Software for the project was provided by Aregon, a British-based software supplier. The system was linked to the packet switching network for the trial phase of operations.

Unlike Prestel, which by then was evolving into a business-oriented service, Bildschirmtext was developed as a consumer medium with the emphasis on the home users. Banks, retailers and other local merchants were signed up as Information Providers (IPs) with gateway capability enabling a person to move marks between accounts, pay bills, or buy an item from a local store and pay for it from the bank account or credit card.

Actual pilot service began in June 1980 with users paying about $2.60 per month. Connection to the GEC 4082 was made by telephone and Datex-P over terminals provided by Philips and ITT. While the initial testing phase is over, several thousand users remain on the system awaiting its full scale public implementation. Originally scheduled for public operation in 1982, this next phase won't begin until this year. When it does roll out commercially, it will do so in 10 West German cities for an expected 10,000 users. Nor will the original system architecture remain intact. IBM won the bid for the second generation system and will initially install two IBM 4341, Series 1 mainframes. Computers in Dusseldorf and Berlin will be able to communicate with each other through a front-end processor, and have been designed to allow for additional external computers to interact with the central processors via dedicated lines.

With information currently provided by over 900 IPs, cost of the service will purposely be kept low to build penetration for the service. The Post Office estimates that 78 percent of the telephone population will have access to a Bildschirmtext computer by 1985. And with the interest of small and medium-sized business users in the service, the post office estimates a million subscribers may be on line by 1986. In addition to low service costs, most of the informational databases, gateway links and electronic messaging services are provided free. This is without question a strategy designed to build mass appeal and usage.

Besides banks and retailers, mail-order catalog companies, newspaper and specialized publishers, and travel agents are also on the system. Mail-order is particularly well suited to its new electronic environment due in part to the high cost of postage in West Germany. For the mail-order cataloger, electronic distribution of sales promotion literature and order-taking

continued on pg. 48

Playing in the Present and Future

INTERACTIVE GAMING

by
Carole Gerber

"The Kryons seek to conquer and enslave all civilizations, but the Acheron, who abhor the very existence of matter now wander, annihilating all life . . . are attempting to erase not only our universe, but our very souls. So be it. We colonists will fight to the last soul."

From the MegaWars Commander's Manual
Copyright 1982, CompuServe, Inc.

It's a world of fear as well as whimsy, where a weakened shield or a misdirected phaser command can threaten survival. Players are colonists who for seven hundred years have fought to protect their galaxy from Kryons and Acherons, mastering the intracacies of warfare can mean the difference between life and death, and smart colonists learn to think fast or die. Imagination, concentration and, some say, a peculiar form of videotex courage are essential to learning the intracacies of MegaWars, one of 37 games on the CompuServe network. What makes MegaWars special is that, unlike games offered through other timesharing services, a number of players linked at different terminals to the CompuServe network play simultaneously.

As opposed to single player games where humans interact only with the computer, MegaWars offers users the challenge of pitting themselves against five-toed, two-eyed humanoids as well as the disgustingly ugly creatures that habit the galaxies of MegaWars, SPCWAR, and DECWAR, the multi-player, multi-terminal games currently offered by CompuServe. According to product manager Bill Louden, CompuServe is the only timesharing service that links players throughout the United States and Canada to one another in this manner. Multi-player, multi-terminal games create a whole new level of complexity that most companies today can't carry," says Louden. "It takes a very sophisticated network with fast mainframe computers to handle ten or twenty human players across the country."

Thinking games

In terms of graphics, speed and color, Louden readily admits that games available through timesharing services cannot, and do not pretend to, compare with arcade games. But, he points out, particularly with the player interactive games, there's a competitive edge and a complexity that is absent from quarter-gobbling video arcade set-ups. "Arcade games, and I include the home games through Atari and the like in this category, typically have a shoot 'em up style, use three or four controls and depend more on luck than skill," says Louden. "They tend to mesmerize players because they don't really use the thinking part of the brain — if you try to think too much, you often lose."

On the other hand, Louden characterizes many of the games available through CompuServe as "thinking games." Many, particularly the multi-player, multi-terminal games, have complicated rules, numerous fantasy characters and can take hours or days to master. Rather than running pink-bowed Ms. Pacman through an unvarying maze, players must, depending on the game, make quick judgments about terrain, weather, invading forces and available fuel supply. They must depend upon intelligence, recall, strategic ability and mastery of sometimes complex rules. As with any game, luck of course plays a role. However, a nimble mind plays a much greater part than a flexible wrist and quick reflexes. And it's this mental challenge that players enjoy most.

Greg Miller

CompuServe Product Manager Bill Louden on arcade-style games: "If you try to think too much, you often lose."

Not all play

Creating that challenge is a long, often arduous process — a process that outsiders sometimes erroneously think of as "play for pay." But competition to develop new games, improve graphics, and create more effective hardware and software keeps designers and programmers under considerable pressure. Says Larry Shelley, manager of entertainment technology: "It may appear glamorous but it's not." Louden agrees. "We have plenty of volunteers who want to test the games once they're almost ready for marketing. That's the fun part. It's creating original games, or enhancing ones to suit our system that's the challenge."

CompuServe presently offers four classes of games: simple textual games; screen-oriented games that use cursor positioning, for example, Concentration and Scramble; page-oriented games, which instantly send ahead screen-size sections of much larger pieces of information such as maps; and extremely sophisticated games under development in which shapes, objects, colors, perspective and velocity are predefined. In addition to these four broad categories, games are also defined in other ways depending on the complexity of the hardware and software, the number of players and whether players are pitted against the computer, one another or are competing against both.

Games are also classified as either synchronous, in which each person takes a turn in an orderly manner; or asynchronous, in which players all fire away at once. It's the asynchronous, multi-player, multi-terminal games that are the most sophisticated, the most popular — and the most challenging to develop or enhance. Adding graphics, color and sound to this last category is a top priority for CompuServe, which expects to introduce two or more games with these features within the next several months.

According to Shelley, offering games to suit the software of users is a major problem. "There are practically as many terminal programs as there are micros," he says. Louden adds that users' existing hardware may also limit what can be offered. "There's a nuclear war simulation game that senior Defense Department officials play as training for World War III. It's called Janus and is very sophisticated — it cost millions of dollars to design this game. Their terminals are very high-speed, high-resolution and cost several thousand dollars. You can see the bombs go off on the screen. It's undoubtedly the most sophisticated simulation in the whole world. I'd love to offer it to our customers, but few people out there have the ten thousand dollar terminals necessary to display Janus properly."

Looking ahead

To address some of these issues, CompuServe is developing a device to enhance communication between lower cost micros and the mainframes. "This will allow us to do more sophisticated applications," explains Louden, "and with color and sound effects ... built in we can do more sophisticated games."

Single player as well as multi-player and multi-terminal games will continue to be offered through CompuServe, says Louden, who explains that simpler, single-player games are a good way for new players to be introduced to the system. As new product manager, he is always on the lookout for a variety of good games that can be enhanced and offered to CompuServe's subscribers. Shelley and others have put together guidelines for the types of games sought, as well as the problems inherent in developing the various classifications.

In general, he says, games should be easy to understand with well-written, concise and accurate instruction. Documentation must be in the form of a tutorial that leads the player through a simulated game scenario. The "whys" and "whats" must be explained as the rules unfold. And designers should keep in mind that players enjoy talking back and forth. Razzing, it seems, is as much a part of the fun terminal-to-terminal as it is face-to-face. A brisk pace is a key element for all types of games. "Synchronous, multiple player games should be designed so that one player can't tie up the game," explains Shelley. "The potential for boredom increases as the play slows down. The use of graphics and cursor positioning also enhances games."

Designing

According to Shelley, the skills needed for designing games are different from those needed by programmers who ready the games for play. "Designers must have a feel for what makes good strategy," he explains. "And programmers don't necessarily possess this type of insight. Game designers don't need to know programming. They need only keep in mind that if the game gets too complicated, they'll need an awfully big computer to implement it."

Early games offered by CompuServe were all single-user text games. Louden recalls that when the company began acquiring games, universities were the primary source. "DECWAR came from a university and had a lot of problems when we acquired it," he says. "In a university where kids were playing for free, they tended not to worry about efficiency. MegaWars grew out of DECWAR and required even more time and effort to enhance. It's now the most popular game on the network."

Louden divides players into three categories: computerists, who are interested in computers and like the speed and graphics of arcade-style games such as MegaWars; traditional gamesters, the strategists who enjoy board games such as chess; and average consumers—people who enjoy games but only if they are easy to learn and understand. "Average consumers will spend ten minutes or so to master the rules, and will quit if they don't learn them within that time span," reports Louden. "Traditional gamesters, on the other hand, love complex games with complicated rules and may have a hard time finding someone locally to play with. They use their computers as the medium to play the more sophisticated board games. Our current audience is more computerists than any other category, but the other two markets are growing and we cater to all three groups."

Defining the reasons people play video games is a ripe topic for psychologists. One California psychologist has written, for example, that players of the arcade game, Donkey Kong, may be working out Oedipal

Greg Miller

Russ Ranshaw casts a mighty spell: "Games have the potential to be quite intellectually satisfying."

MEETING UP WITH THE WIZARD OF TEN

No, he doesn't dance around like a sorcerer's apprentice, turn frogs into princes or even hum the score to *Fantasia*. But Russ Ranshaw, otherwise known as the "Wizard of Ten," was once compelled to conjure up an entire Adventure game over a weekend. In person, he's as human and down-to-earth as any other mortal. But beware! Place him before a terminal and he casts a mighty spell.

An old-timer at CompuServe, Ranshaw has been with the company since 1973 and helped set up the original MicroNet system. His wizard moniker springs from his first Adventure game offered on the network. Ranshaw and two other employees sent a message to users offering free game play time and signed it "Wizard of Ten" because the original mainframes were PDP 10's. The nickname stuck with Ranshaw, whose wife later made him a wizard costume to complement his professional persona. Ranshaw has solidified his wizard image by appearing in full regalia at trade shows and other computer-related events.

How he became a wizard should, by all rights, be a bizarre and magical tale. Alas, such is not the case. In-problems. Others speculate that troubled individuals use video games to work out feelings of inferiority, hostility or—conversely—superiority. Video games have facetitiously been referred to as the most popular but least physically taxing indoor sport — California game designer Allan Alcorn has said that "video games were designed as a way that someone could participate in sports while maintaining a firm grip on a can of beer."

Game player survey

A recent TODAY on-line survey of CompuServe gamesters turned up some interesting revelations about players' motivations. "I feel like a different person when I'm playing," one user reported. "I feel more aggressive. It brings out the killer instinct," he added. Another man, who says he plays games about 40 hours each month, admits "It adds some distraction to my simple life." A high school boy who claims to have played 500 hours on the system, says simply "I love it so much I can't explain it." An older player describes his game-playing as "An exercise in logical problem-solving."

Most respondents said they play by impulse rather than design and that spouses, in most instances, encouraged their interest. One man, who said he was "married with regrets" declared his wife complains about his tying up the phone for long periods while playing games. He suggested an on-line dating game for adults only. One of the few women responding to the survey said her husband bought the computer for her and encourages her to play. Most users reading habits reflect a lively interest in print as well as videotex. They claim to read, on average, several books each month as well as numerous magazines.

All in all, there are probably as many reasons for playing video games as there are human beings who play them. As with other types of leisure activities, video games can provide release from stress and a short and soothing vacation from the mundane. It's heartening to know that the use of games to escape life's realities is perhaps as old as civilization. Exactly seven hundred years ago, in the year 1283, Alfonso X, the king of Castile, wrapped it all up in his introduction to "Libro de Juegos," the first book of games in European literature. "God has intended men to enjoy themselves with many games," he wrote. "For games will bring them comfort and dispel their boredom."

To that sentiment, most video devotees would add a heartfelt, on-line "Amen."

Carole Houze Gerber is a contributing editor to TODAY magazine.

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stead, it's a story of hard work, an early and well-nurtured interest in electronics and a "right place-right time" introduction to computers. Keenly interested in science as a child, as a teen-ager he taught himself — with guidance from his father — how to repair radios. The hobby grew into a home business which later spurred his interest in electrical engineering, his major at the University of Pittsburgh.

"I cut my teeth on electronics as a youngster," Ranshaw recalls. "Later I dabbled with ham radios. I had a passion for working with code and small transmitters. Then later in my undergraduate career we finally got an IBM 650 computer at the university. This was in the late 1950s and it was a very big deal. At that time, the experts were saying things like "Perhaps someday there'll be as many as 10 of these things around.

"It did decimal arithmetic, had about 2,000 words of memory and generated enough heat to warm three houses. It was quite a monster!"

It was a monster Ranshaw wanted to tame and he immediately signed up for an elective course in the new technology. His involvement was immediate and consuming. "I fell in love with the whole idea of programming," he says with a smile. His interest went beyond the course requirements and his abilities far outstripped all expectations. (Even wizards have an occasional stumble, however. Ranshaw almost failed his other classes during the early part of his love affair with programming). The following summer, 1959, he was hired as an undergraduate assistant at the Computer Center, a job he held on a part-time basis until his graduation in 1960. He spent six years at the University of Pittsburgh Computer Center where we wrote a number of programs, helped develop the first comprehensive monitor system for the IBM 7070, and wrote a Fortran compiler for that same machine. He then moved to the University of Pittsburgh School of Medicine as an assistant research professor. There he was involved with lasers, analog work and image digitizers as well as computers. A major project was through a NASA grant to develop a method for conducting computer analysis of human blood cells, including the development of a specialized microscope. He earned his Master of Science degree in Computer Science in 1971.

During his 10 years at CompuServe Ranshaw has earned a reputation both as a generalist and an expert. His title, internal consultant, reflects his jack-and-master of all trades expertise. He has worked on the monitor system and various utility languages as well as on the games at which he is, of course, a wizard. Not surprisingly, Ranshaw says separating his professional and personal interests is difficult. "I can sit down and chase a bug in the program and see it as recreation," he admits. A continuing hobby is his home computer system, designed and built by Ranshaw. "It keeps evolving," he reports. "But I must say that I don't have the time to work on it I once did."

Games, at home and at work, are his favorite activities and he enthusiastically defends their benefit to society. "We've noticed that people buying home computers have very high ideals. They plan to use them for record-keeping, education and news service — very high-sounding goals. What happens is they play games — and that's not a bad thing. Games have the potential to be quite intellectually satisfying, from the simple ones that kids can play to the ones that Einstein-caliber adults would find tough."

Ranshaw believes that games offer otherwise buttoned-down adults a much needed escape into the world of fantasy, an opportunity to rocket through space, slay fire-breathing dragons. And yes, match wits with a wizard.

—C.H.G.

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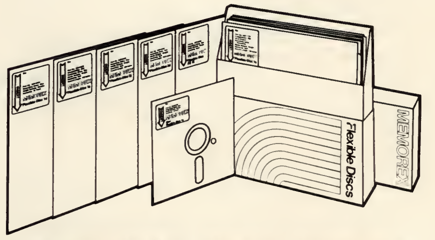

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ADVENTURING WITH SCOTT ADAMS

by Charles Bowen & J. Stewart Schneider

You'd think Scott Adams might want to just rest on his laurels.

After all, his "adventure" games for microcomputers have created a whole new world of mystery populated with hobgobblins, witches, pirates, princesses and dreaded purple worms.

Meanwhile, back on this side of life, those games have meant a financial empire for Adams — Adventure International, a worldwide corporation that distributes from its Longwood, Fla., headquarters some 200 different computer programs by Adams and other software authors under contract.

If Scott Adams never wrote another line of programming, his works so far would secure his place in the hall of fame of microcomputers.

So why doesn't he retire, take it easy?

Well, he might, if those accomplishments were the culmination of a lifetime of work. But Scott Adams is a young man — he turned 30 last year — and it's taken less than five years for his programming business to become a multi-million dollar corporation.

Adams says he's not ready to wile away his days in the sun. In fact, his work routine isn't much different today than it was when he started what was one of the first microcomputer software houses in the country.

"I spend most of the day running the company," Adams said, "and a lot of nights and weekends programming," making sure that he still has plenty time to sit in front of a terminal.

But Scott's schedule may be one of the few things that hasn't changed around the Adams household.

Back in 1978, Adventure International was little more than a rather optimistic name for Scott, his wife, Alexis, and a program called *Adventureland*. But to get to that point, we need to step back a few more years to when Scott, with his B.S. in computer science from Florida Institute of Technology, worked with mainframes as a programmer and consultant.

His work was respected by his colleagues, but, honestly, not the stuff fan clubs are made of. He helped design a computerized flood control system for West Palm Beach, the first of its kind in the country. He worked on a civilian contract for the Air Force, writing a classified paper on computered radar analysis. He improved his alma mater's ledger and payroll programs.

Len Pelham

Adventure series creator Scott Adams: "I spend most of the day running the company and a lot of nights and weekends programming."

Then in 1978, while working on a DEC PDP, Adams encountered a text adventure game by William Crowther and Don Woods called Colossal Caves. Adams was intrigued because, unlike the several hundred versions of Space Wars that were making the rounds of mainframe systems during the early '70s, this game placed the player in the center of an adventure in which he had to slay dragons and solve riddles to win, a combination of game and storytelling, and without graphics. The player guided his protagonist from room to room, instructing him through the keyboard as to what objects to examine, what doors to open and what to leave untouched.

Scott already had been interested in the new microcomputers for some time. He had a homebrew Sphere micro and had purchased one of the first TRS-80 Model I's. Since the TRS-80 was not known for its graphics capabilities, Adams was struck with the notion of creating his own adventure game.

By the summer of 1978, he'd finished *Adventureland*, a BASIC program that really wowed them at TRS-80 computer clubs in the area. Scott was a local celebrity in Florida computerdom.

But, looking back on it, the difference between a great game and a computer legend was made by suggestion from friend and fellow programmer, Lance Micklus

"It was funny," Scott recalls. "Lance kept saying, 'It's too slow in BASIC. You have to re-write it in assembler language.' "

Not looking forward to the arduous task of starting over and converting a 16K BASIC program to assembler language, Scott sidestepped the recommendations. " 'No, no — it's fine the way it is,' I said. But Lance kept after me. 'If you don't do it, I will,' he said."

Six months later, Adams gave in and converted the program to machine language. The difference was remarkable. What had been an enjoyable, but plodding, BASIC program was suddenly a sleek, rapid-fire game. The game's protagonist, who had stumbled through the game in BASIC, now could run through the rooms. That, combined with another innovation Scott had added — a split screen that allowed the player to enter his instructions at the bottom of the screen — produced a game unlike anything on the market going into 1979.

To fully appreciate the impact of Scott Adams' *Adventureland* game on the TRS-80 community, you have to think back four years ago. At the end of the 1970s, Tandy, whose competitors could be counted on the fingers of one hand, grabbed more than one-fifth of the small computer sales — virtually everyone who wanted a low-cost machine.

If, as a TRS-80 owner, you wanted to play games, your selection was limited to an assortment of Star Trek games, Blackjack and a collection of other card games. All were fine for their time, but they were blown out of the water by the cerebral *Adventureland*.

Adventure International became a company in March 1979, but Adams had been developing programs for it since the first of the year, with most of the first three months of the year spent working on revisions and refinements. By the end of the year, there were nine Scott Adams adventures on the market — *Pirate Adventure, Mission Impossible, Voodoo Castle, The Count, Strange Odysses, Mystery Funhouse, Pyramid of Doom* and Ghost Town, in addition to the original *Adventureland*.

Adventureland not only seized the attention of major computer publications of the time, but also spawned an army of admiring imitators.

For example, Bob Liddil says his Programmer's Guild took "an after-market position to Adventure International, whose releases in that genre were slower than the public's willingness to buy." Liddil, writing in Programmer newsletter last year, noted that Scott started with something essential to commercial success: something unique.

"*Adventure*, hitherto unknown except on mainframes, was an instant success ... Scott's fortunes multiplied quickly, and he was astute enough in business to parlay *Adventure* into a gravy train upon which many could ride, but of which he always remained the engineer."

There was another element to that success. Scott's programs gave a new respectability to game-playing. Most of computerdom's "serious hobbyists" were familiar with the games around them, but they approached them as guilty pleasures. If you liked them, you certainly didn't let on.

Not so with Adams' games. Many programmers felt it took the same kind of cerebral energy to solve one of Scott's mysteries as it did to write assembler code.

Bill Louden, CompuServe's product manager, has been hooked on Scott Adams' games since his days as a Radio Shack computer center manager prior to joining CompuServe in the late '70s. He still has on file the maps he carefully inked while exploring each of Scott's worlds.

"I consider him one of the gurus of the microcomputer industry. His games are stimulating intellectually, very logically. I don't find any cheap tricks.

"He probably has brought a different level of *creditability* to game playing for adult. A lot of people are still embarrassed to say, 'I play *PacMan*,' 'I play shoot-em-up games.' They really are a mundane, eye-hand coordination kind of game, with very little thinking going on.

"Scott's games require a mastery of logic. Not only do you have to figure out the logic of the clue, but then you have to put them all together and solve a puzzle. That's what the adventure games are."

Louden, who oversees CompuServe's growing game section, was instrumental in bringing on line nine of Adams' games. Few subscribers, he acknowledged, may take the time to play an entire adventure on-line, but the programs "have served as a cross-sale — they can try it before they buy it."

If you're unfamiliar with the Scott Adams classics, you can view them by entering "G GAM-28" at any ! prompt in the system. You can get playing instruction there. Or, if you already know how to play adventure games, "G GAM-127" will take you directly to the Adams Adventures menu.

When you think about it, it was only natural that CompuServe and Scott Adams would grow up together. CompuServe's earliest subscription list when it started in late 1979 was dominated by computer professionals and serious hobbyists, the kind of computerists who usually turned to Adams when they wanted to play. And the love affair hasn't ended. This year you can still find messages around the system like this one taken from the National Bulletin Board:

"Help!! I can't stand it anymore. Can ANYONE tell me how to get through the crack in the wall in the Voodoo Castle????"

Meanwhile, back in Longwood, Fla., Scott Adams hasn't been resting on his laurels.

First, he wrote what he calls his own adventure language to make creation of new games easier, then started on more advanced adventures. Going into the '80s, they began flowing out of Longwood to hungry fans — *Savage Island*, his first two-part adventure, and *Golden Voyage*, thought to be his most challenging adventure to date.

But, as Liddil noted, Adams the businessman was also hard at work. Other freelance programmers were brought into the catalog — some of them the top names in the young industry, Lance Micklus, Jymm Pearson, Robert LaFore, Doug Carlson, and Bob Schilling. Today the stable of freelancers under contract has grown to more than 60.

And the in-house staff has kept pace, growing from two (Scott and Alexis) in 1979 to more than 40, and Adventure International keeps outgrowing its quarters. It has moved four times in four years, and Adams says they expect to move again sometime this year.

Also, like many support businesses in the microcomputer business, Adventure International has diversified to serve new areas in the computer community, Adams noted.

For one thing, last year a new branch of the company, The Business Division, was created to market financial software, such as the popular Maxi Cras, Maxi Stat and Maxi Mail series, as well as utilities and programming tools.

Scott Adams is not what journalists call an "easy interview." Given those

continued on pg. 48

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Tips From the Top:

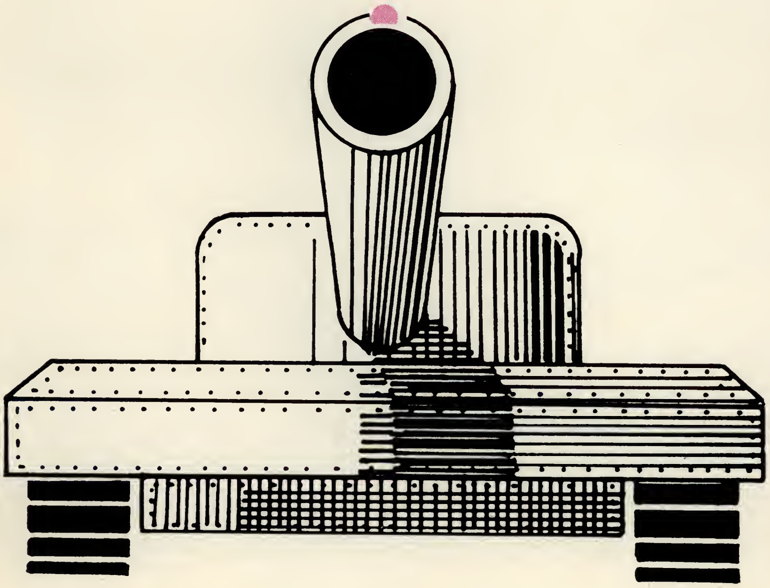
TALKING WITH AMERICA'S BEST GAME CREATORS

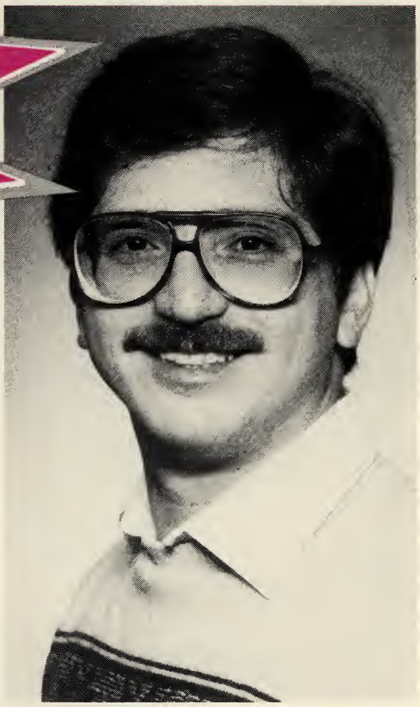
by Kathy Bissell

It's been said that most home computers are purchased with the idea of playing computer games. And that's one reason game creators have become popular idols. Cult figures. Some games are so popular that special clubs and contests have been developed for them. Others are interesting because they have wide appeal, because they are like arcade games or because they reward special playing skills — strategic or manipulative.

But how did the authors of these games get their start? How long did it take them to create their best sellers? What are they working on right now? What do they think makes a game stand head and shoulders above all others? And, if we wanted to, how could the rest of us get into creating computer games?

To get the answers, TODAY went straight to the top — the top of the best selling lists, that is — to talk directly with several creators of this year's most purchased computer games. Each creator's story is a bit different — as are their games. But all share a genuine enjoyment for the creative process, for the idea of creating games and for the challenge of the process involved in getting ideas from their minds onto the computer terminal screen.





Dan Gorlin

DAN GORLIN
CHOPLIFTER

Dan Gorlin — who everyone at Broderbund Software calls Danny, is the creator of *Choplifter*, an arcade-type computer game that has lead sales across the country for the better part of a year. Surprisingly, *Choplifter*

CHRIS JOCHUMSON
THE ARCADE MACHINE

The Arcade Machine is a different approach to computer games. It gives the player the tools to create any number of custom games that can be played and enjoyed. Modified and massaged. Made harder or easier. "Anything to get the power of the computer into the hands of the people, I'm interested in," says Chris Jochumson. Those who play *The Arcade Machine* even have their own contest. "I just picked five finalists. It was exciting to see," he adds about the contest entries.

Jochumson started working with an Apple computer in 1977. "I was in the Air Force and was home on leave." He was headed for Korea. "I was the first person on my block to have one. I took it and played it," he says.

is the first, and to date, the only game that Gorlin has authored. What's even more amazing is that he created it on a borrowed computer.

Gorlin says he was a "piano major at four colleges for seven or eight years." But he took a couple of computer courses, and a strong math and physics background helped him. "It seems like the two (music and mathematics) go hand in hand. It's common for scientists to be interested in music," he adds. Through one of his professors he got a job at the Rand Corp. "I was hired in support services," he recalls. It was not a high level job. "As I got better, I worked up the ranks," he says. "When I left I was working along side PhD.s. I stuck my foot in the right doors and asked questions. Got on-the-job training in computers." Rand, he says, is working on high level artificial intelligence. "These games are more like pocketwatches," he says to compare the differences in the kinds of work.

In December of 1981 Gorlin borrowed his grandfather's Apple computer. "He sort of collects gadgets," Gorlin says. Lou Gorlin, without whose Apple computer we might not have had *Choplifter* to enjoy, lives in El Toro, California. He enjoys having played a part, according to grandson Dan.

Creation of *Choplifter* took six months. It was released in May of 1982. Gorlin says his main goal when he was working on the game was to sell it. "I get very serious about projects when I get into them. Along the way I wanted to make sure it was what people wanted." The experience was so enjoyable that Gorlin says he intends to create computer games forever. "Right now, I want to get good. I don't think what I did is anything spectacular. I want to look at other machines. My next game will have to be better."

Choplifter, though, is special to Gorlin "because I finished it. In a deeper sense, you see things that don't match expectations. But *Choplifter* did everything that needs to be done." He is working on another game now, but because being first with a new idea is so important in the computer games market, Gorlin will give no clues.

At age 28, it would seem that Gorlin has it made. When asked what others who were interested in creating computer games should do he suggests: "In general I would tell them that it's a matter of whether or not you are suitable for this kind of work. You have to be an obsessive perfectionist. You have to be a doer. You have to be interested in totally new things and not ask what to do next." And finally you have to "finish your stupid game." While it sounds easy, finishing the game, making it right, is, to Gorlin's way of thinking, one thing that is the hardest about creating a game.

As for books to read and sources to check, Gorlin says that the whole nature of game creation is that you have to be in the forefront. "Anything in a manual or a book is old." But for those who are interested, learning programming and assembler language is essential.

Borderbund is special, as far as Gorlin is concerned "because we try to go for the highest quality we can. There's a sharing of ideas and helping each other out. It's essential to people to get associated with the right people. To interchange ideas and techniques."

Gorlin himself does not play the arcades. "I don't play them to enjoy. Most games aren't interesting enough yet." For him, the game is in the creative process.

"There is something about games," Gorlin concludes. "Everybody can start, but not all finish. They are a consuming, full-time thing. If you can't handle it financially or personally — don't try it. It's like going to Hollywood when you can't act and you're not pretty. There's a difference in wanting to be and wanting to do. You have to want to do it."

GAME TIPS: *If you don't knock out the tanks you will be better off. If you knock out tanks, another round will come. I like to leave the barracks closed until I want to get hostages. Land close to get loaded before a tank or plane comes along."*

After leaving the service, Jochumson says he went to work in electronics but got discouraged. In his spare time he worked on a game, *Space Quarks* —his first. "I liked it as a hobby. I was working part-time and going to school. I had the GI Bill. I thought this (computer games) is too good right now." So he quit school. *Space Quarks* brought him about $18,000.

After *Space Quarks* came *Track Attack*. Jochumson's third game was *Graphics Magician*. *The Arcade Machine* took eight months. "It was a long process. The concept allows people to create an arcade game. There are shapes, paths, background colors. There are options to the game. Options to the levels. *The Arcade Machine* is a good way to learn the capabilities of computer games without learning programming. In the future programs will be done like *The Arcade Machine*.

When it comes to learning how to create games, Jochumson just says, "The way I learned was sitting in front of the computer and doing it." Right now he is concentrating on products that "deal with graphics and allow the person who is not a computer professional to use them. Programmers have to design graphics, but nobody said programmers are good artists."

Jochumson doesn't enjoy playing computer games "that much." He'd like to see more games that "add more skill, have less hand-eye coordination." He also likes to get "more realism into programs."

"More skill is the wave of the future. When you require people to think, that's the best way to go," he sums up. "*The Arcade Machine* is different than most games. I'm still excited about it."

Chris Jochumson

STEVE BJORK
CANYON CLIMBER

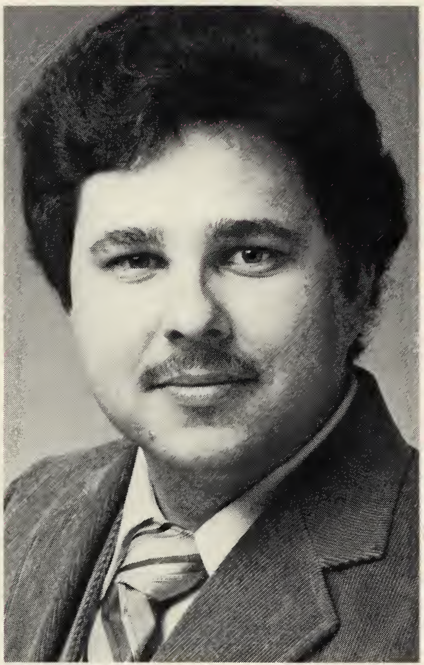
Canyon Climber was "originally done outside house, but I was instrumental in writing it," says game creator Steve Bjork. It took three to four months for the first variation, and translation to other computers took at least two months each. "We wanted to do all we wanted to do," he says. The result, according to Bjork is that "It has a good, solid rock feel — like arcade games. It's well done." The other goal of *Canyon Climber* was to be unique, not a copycat game.

Because *Canyon Climber* is three games in one, it eliminates the problem of becoming bored with a game. "Generally, when you start (a new game), you can't get beyond the first screen," Bjork says of many games. "But adding different screens is currently difficult and costly. Not as costly as three new games," he adds. The secret is to use parts of the first game in the second and third ones.

Bjork got his start with a Radio Shack Model I in 1977. He guesses he's created between 20 and 30 games to date. "You have to love 'em, not like 'em," Bjork says as his requirement for creating good games. "Nine times out of ten, arcade junkies do a good job (creating games). You do need a good college background, two to four years." But most colleges don't have courses in exactly what you need to know to create games, Bjork says. "I have gone up to calculus in my math for programs. You need higher skills, formulas "for shapes."

He advises people to "buy your own machine and play at home. Write a few programs. Try machine language or assembler language. Companies don't want to bother to train you. You need to build your programming techniques." Bjork recommends those who want to get into game programming learn PASCAL because it teaches structured programming. "It's important especially when two or three people are working on the same project," he says. "They all have to be able to speak the same language."

"I hope it lasts for quite a bit longer," Bjork says about his career as a game creator, "because I love it! I spend all day working and playing with games. To me it's the fun of it. I can't see myself doing anything else."



Steve Bjork

Bjork, who has worked a variety of jobs like being an amusement ride operator at Disneyland and a magician at a couple of night clubs, is self-taught at computer programming. One of his favorite places is the Malibu Grand Prix game test center. "I got to play the first Tron machine that was shipped." Right now, his favorite games are *Ribotron* and *Pengo*. The former, Bjork says, is hi-tech, with "lots to do, takes lots of intelligence to run," and the latter a cartoon-like maze where you squish snowbees. "I liked Tron when it was hot," he adds. Right now, he recommends the *Ms. Pacman* game for home video systems, too, because he says the graphics are just like the arcade version.

Bjork's latest game is *Zaxxon*. Datasoft will offer an iron-on transfer to those who return registration cards from the game. "*Zaxxon* is as close to playable as *PacMan*," Bjork says.

GAME TIPS: *"In the first scene, whenever possible, use the ladders to avoid getting hit by goats. Watch the goats. The longer you're on the scene, the faster the action becomes. Don't bother with shields. Get to the top as fast as possible. Shields only last a certain time. They can act to hurt you not help you. On avoiding rocks: Two birds are dumb. One is smart. It will drop rocks. When it flies over, fly at the same height. Practice, practice, practice."*

BOB FLANAGAN
SPECTRE

Unlike the others, Bob Flanagan doesn't have a game in the top thirty list, at least not right now. Also unlike the others, Flanagan is something of a phenomenon. At the ripe old age of 20, he has already created six games with varying degrees of success. His latest creation is a three-dimensional maze game called *Spectre*. The game is back ordered. Flanagan compares it to a combination of *PacMan* and *Tron*. "There's a view down the main corridor and you can't see the enemy. There's a split screen with half as the 3-D corridor and half as the maze game. On the right, there are little dots and big dots. They are energizers. Head toward the energizers as soon as possible.

"The 3-D corridors are like *Tron*. I had it done before *Tron* came out," he says for those who think he was copying the movie idea. "It took a long time to do. Initial writing of the game and getting it on the screen and working took three weeks. Making adjustments, changing the number of enemies, with levels, took two months. I submitted it and they gave me a modification that would work."

Flanagan got his start in seventh grade. "I had a math class that required us to use the computer to do problems. It was to familiarize us with the computer. That was all the contact I had with it. Then I spent a lot of time in the computer room — I was what you'd call a hacker — on my own."

In tenth grade Flanagan bought an Apple. "I paid half and my mom paid half. I used babysitting money. Some money that I'd saved up in a savings account. Money from mowing lawns. It was the original one and I'm still very happy with it," he adds. "As soon as I got it, I started learning assembler language and before long wrote my first game, *Speedway*." *Speedway* was an arcade-type game that made $1,100 for Flanagan in two years. He then wrote some arcade imitations which were sold to a company that, as Flanagan says, "folded." *Thief* was his first game for DataMost, although he wrote another game under an alias for another company. Following *Thief* was *Pandora's Box* which he wrote with Scott Miller. "He worked on the shapes animation, sound, flow of the game. I was spending time in the pro-

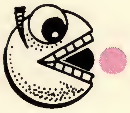
gramming," Flanagan explains.

Recently Flanagan returned to his high school for a career day. "People know my name because of *Thief*. Those with Apples know me." Because of his early success, he's also been featured on television and in *California Living* magazine. And Flanagan is quick to give tips to would-be creators of computer games. "There are three parts to the games. The sound, the graphics and the playability. The sound and graphics, anyone can do, if they set their mind to it. Read a book. The playability is the most important. How easy is it for a first time player to pick it up and not get discouraged and yet as they get better and more advanced, not bore them? The key to real successful games is playability. Thief is closest to arcade games because of playability."

Flanagan did not go to a special school to learn his programming expertise. "If you're into computer games, there's no school," he says. "They can teach you how to program and how to program right. But you have to work on your own. I did because I was ambitious and curious. Take a course. Read books. Learn assembler language. There's no formula for that." He suggests *Arcade Game Design*, a book, as a possible source.

Favorite games for Flanagan include Raster Blaster, Repton, Turmoil — which he calls "simple but addicting" — and the Pinball Construction Set. As for creating games, he says "I just enjoy it. Creating games that I can watch someone else play and get into. It's like creating a book or a painting. People get enjoyment from it. It's very rewarding."

Flanagan still plays games on his Apple. But when it comes time to create a new one, he turns to pencil and paper first, not to the computer. "I like to be away (from the computer)—so I don't feel the restrictions that it has. I don't want to deal with them when I'm creating."



Silas Warner

SILAS WARNER
CASTLE WOLFENSTEIN

When talking about the success of *Castle Wolfenstein*, Silas Warner says "there are subtle relationships, timing; it's hard to put it all together just right. I don't claim it all myself. There was probably a lot of luck involved. It's playable. Continuously interesting."

Castle Wolfenstein was created between February and September of 1980, with a working version finished in June of 1980. "I started with a character generator for Apple and got it fast enough to do animation. I got the idea of someone running around. Then I watched *The Guns of Navarone* on rerun. From there I got the idea of a World War II setting. The voice of the guy talking in German came from there."

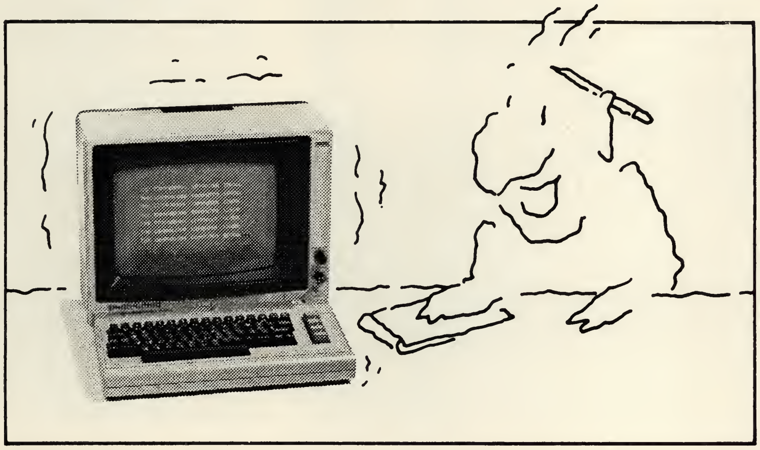
Although *Castle Wolfenstein* has not had a club or contest, *Robot War* has an ongoing event as well as a club starting up. "You can put up to five robots on the field. Battles are going on all over the country." People send in their disks (not to Muse Software, however, but to the club that runs the event), keep score, to determine the winner.

Warner's background in computers stems from his college days at Indiana University. "We had the Control Data Plato system, which, although designed for education, was the greatest game system ever invented," he says. Warner purchased an Apple in 1977 and realized there would be a need for programmers. "We founded Muse in Ed Zaron's living room." Zaron is president of Muse Software.

Muse has published the *Old Maze* game and *Tank War* both of which Warner says were quite popular in their times. In addition to games, Warner has also written a lot of business programs. For those starting out, Warner says the "big thing is to learn how to program your particular computer. It is possible to write games in BASIC, but only if you are willing to put up with slow, clumsy games. You have to improvise to get some good graphics." Translating games from one computer to another was also a learning process, according to Warner. When they first went from Apple to Atari for *Castel Wolfenstein*, "the same transmission was jerky, unpleasant, the voice didn't sound right." They reworked it to be like the Apple version.

Right now Warner is working on a new game, but he's silent on any clues as to the nature of it. "Yes. Period," was his only response. Usually Warner doesn't play the games. "By the time I get done, I've mastered the game. We play and test them (other

Opportunity hummmmmms.



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games) out. I don't usually play. I test to try to figure out how they did it. I like to look around to find out what's new. When I'm in New York, I go to Station Break in Penn Station and play the games there."

Warner is also interested in CompuServe and belongs to a couple of Special Interest Groups, and uses CB Simulator. "I have to admire the channel for adults only idea. That's because the kids get on that one and it leaves the others free for the rest of us."

GAME TIPS: *"One secret people may not know is the schnapps. What happens is that you can't shoot straight if you have a lot of schnapps. To get around that problem, you should eat a lot of bratwurst."*

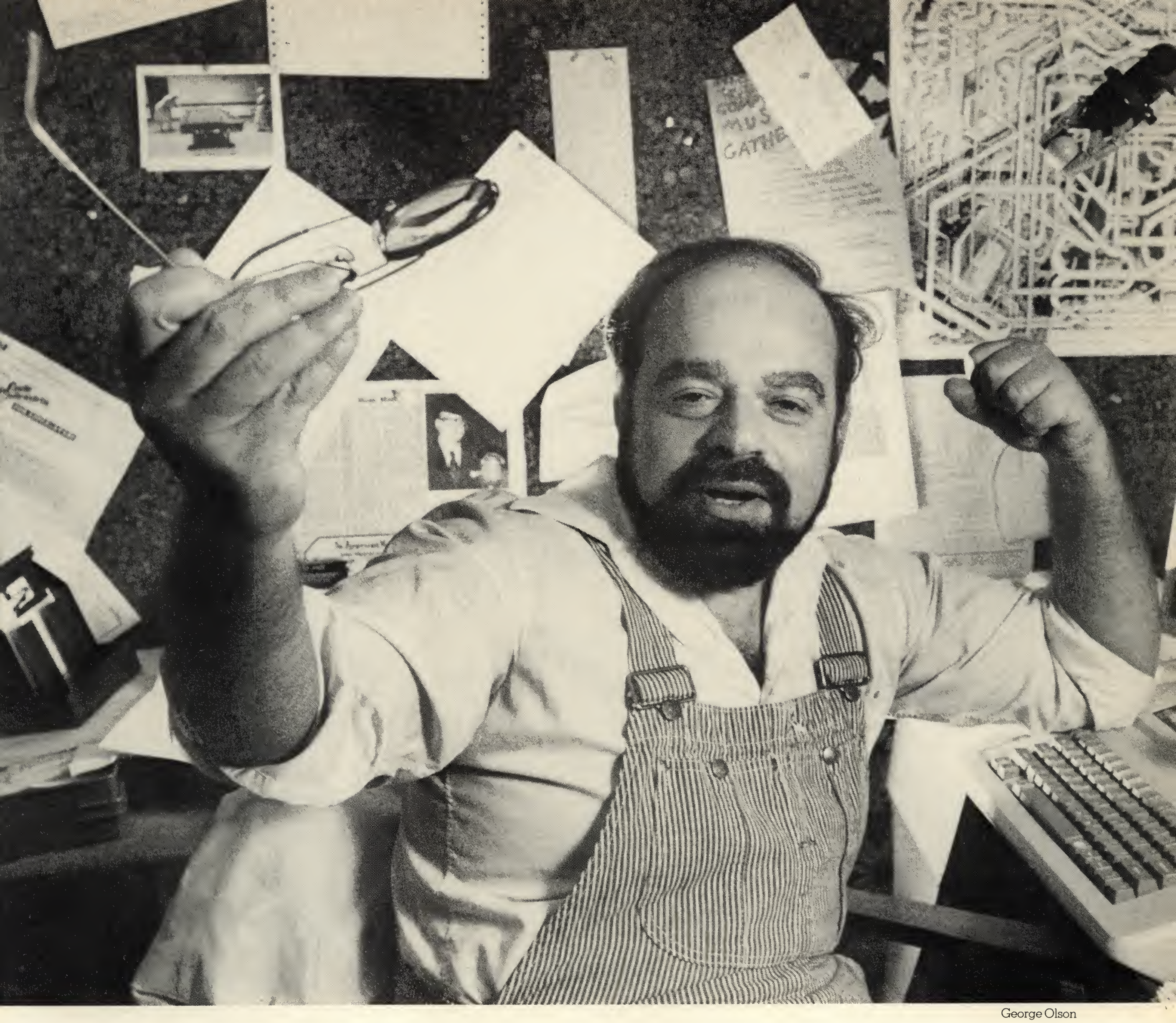
So, as a game enthusiast, what should you watch for in the upcoming months? The hot topics, depending on who you talk to, seem to be in two areas: The hi-res graphics plus text camp and the 3-D camp. But be assured, if creators have not just introduced a game, they, these five at least, are working on new ones.

All seem to agree that if you are interested in learning how to write games, there is no substitute for learning programming, learning higher level programming techniques and learning assembler language. Then, practice, trial and error and tenacity will help you get through. Many games have been created on weekends, during evenings. But obviously it will take longer than if you can go at it full tilt.

Even if books are obsolete by the time they are printed, they are still useful for you if you are learning the basics. Once you reach sophisticated levels, however, the more you can talk to and be in contact with people who are involved with state-of-the-art programming techniques, the better your chance of succeeding. That's not to say that you have to be a programming whiz to make it. Sometimes, if a company likes your idea and it's fully developed, they will get someone to help you create the parts that are beyond your skill level. But one major complaint that companies have about submissions is that they are either not completely thought out or that they simply copy an existing game. So, if you're being creative, try to be somewhat original, too.

Although most of the people we talked with were quite young, age has nothing to do with it. One of our game creators cited a 55-year-old success story at their particular company. So what are you waiting for? Take a chance. Learn how to program. Get your game idea down on paper. And maybe you, too, will wind up like Steve Bjork who has a California condo and his own personal Asteroids Deluxe and Atari VCS at home. Your imagination and your computer are the only limits.

Kathy Bissell is a free-lance writer from Columbus



George Olson

Game creator DeKoven in his Palo Alto workshop: "Basically, I daydream."

THINKING UP GAMES: MY SECRET KNOWLEDGE

By Bernard DeKoven

For more than a decade I have been making my living primarily as a one-man university of play. I know a lot of games and I've played a lot more.

I know a couple hundred kids' playground games and a couple hundred party games and hundreds more mental, paper and pencil, board and computer games.

Every game is a system of interactions. Each one adds to my vocabulary of patterns, structures and balances, which I abstract and combine to form new games.

For example, you have tic tac toe and you have checkers. In all likelihood, with a few changes, you could have tic tac toe-checkers. You have Moon Lander and you have Asteroids. Put them together and you have Gravitar.

My process

Basically, I daydream.

I have learned how to daydream in different resolutions—in motion, color, sound and feel, as played by an Atari VCS or an Apple or an arcade machine.

I dream about the interaction of images. I dream, moving without logic, until I find an interaction that I want to get into, a world in which I want to play.

I put myself into the world I have dreamed up, and, as long as there's something fun to try to make happen, I stay there. If I'm there long enough things start happening that are beyond my ability to imagine — interactions that are more complex than I can make myself visualize.

It is now time for computer assistance.

Collaborative development

When I'm not dreaming up interactions or playing with game concepts on the computer, I work with other liveware — including artists, programmers, marketing visionaries and department heads.

Collaborative game development is an art in itself. There are clearly valuable resources that can be brought into the development process: kids, teachers, psychologists, computer musicians, graphicians, writers, etc. There are so many facets to a computer game that there is frequently an entire production team just to deliver one design.

The problem with assembling such a team lies in the balance between the members' ability to communicate ideas freely while establishing clarity over who contributed what. The term "designer" is a misleading one that must be applied equally to the person who conceives the game structure, the person who visualizes and develops the graphic costumes and scenery, the person who devices the hard computer algorithms, etc., etc.

No matter who gets credit for what, nothing constructive can happen until a common understanding of the game concept has been achieved. I have rarely seen such an understanding reached in written form. More successful is storyboarding — portraying the game concept in comic book-like panels of words and drawings; and prototyping — developing a real-time working software model.

Storyboarding

A completed storyboard can account for every keystroke, graphic, sound and alternative from the attract mode all the way to the most difficult level.

Way before such a level of elaboration is reached, however, the storyboard can be effective in conveying a notion of the game. Since so much of the game relies on videographics, the drawings of the screen at different moments in the game are extremely helpful. A good artist can prove an invaluable asset to product development, not only in storyboarding, but also in helping to visualize alternatives as they present themselves during creative brainstorming sessions.

Prototyping

There are several stages at which prototyping can be essential to the game development process. Many times, before I can continue to elaborate on a game concept, I need to have a working model. Ideas can become too complex to conceptualize without a model to play with. I have learned to trust more the game concepts that evolve from play than those that are arrived at through discussion and contemplation. A prototype can also allow for variations that can lead to a "whole 'nother game."

Flowcharting

There comes a time when the proto stops and the typing begins. The programmer has to have a complete and virtually inflexible description of the game so he can go off somewhere and pound out code.

I like to put off that time for as long as possible. Things happen when a game gets coded — the programmer discovers a cheap effect, a limitation, a novel twist or unanticipated results — and the concept has to be flexible enough to change, to take advantage of or to work its way around each discovery, all the way until the final stroke of first-time-user-proofing. Creative flexibility is best established on a rigid framework. A well-structured flowchart is extremely helpful when adapting the design.

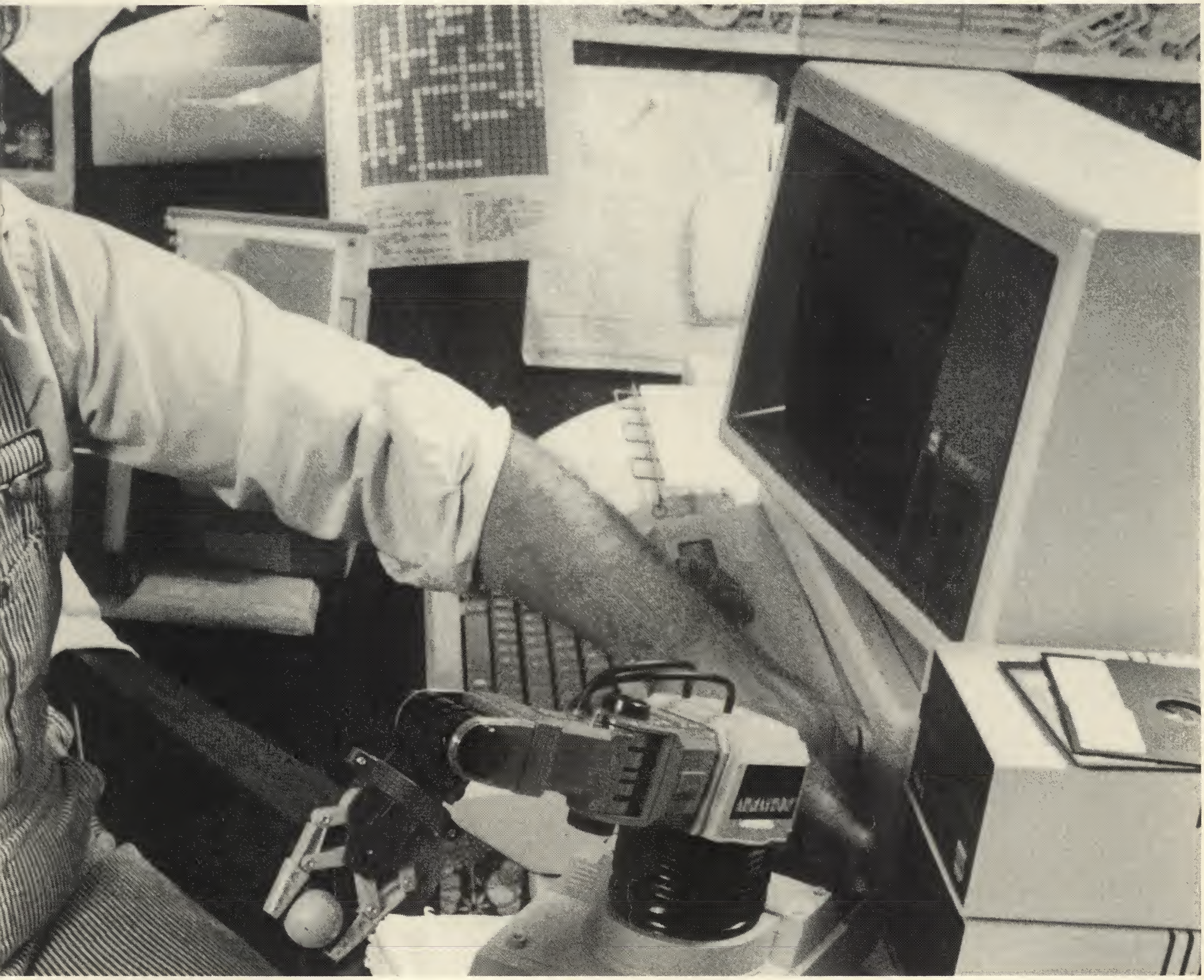
Dynamic paradox

As I search through my vocabulary of games, I look especially for novel pattens of interaction between elements that are basically contradictory. Games are all about paradox. Paradox produces the tension and the humor. For example, tag is about the paradox of being *it* and being *not it*. Pac-Man is a tag paradox. When I imagine myself playing the game, if I can also imagine moments when for almost every reason I can come up with to move left, I can come up with an even more strategically sound reason to move right, then I know that I am playing with a concept worth taking seriously.

Life

While still in the prototyping stages, there come times when the game an-

DeKoven with his "Armatron" toy: "Games are all about paradox. Paradox produces the tension and the humor."



George Olson

imation suddenly takes on life. There's an interaction going on that is not just an animated idea, but a relationship, a gestalt. Things react to each other. They perform the unexpected. They take on character. They pursue or attack or run away. They respond.

At the final stages of development, the game not only has life, but it has a wholeness, a balance, a complete, if not tangible, dynamism. This is the stage when I get to interact in real-time, when I go to face my first "death." Joystick in hand, I move through the world, attempting to anticipate, to reach some hidden reserve of brainpower to avoid untimely demise—and dying anyway.

World creating—otherness

It is my personal criterion that the world that is ultimately created in the process of becoming a game echo a different aspect of reality—a "law of the jungle" world contrasting the daily world of civilized man. The worlds I create must be thus, echoes of more complex and subtle laws of physical psychological and social realities.

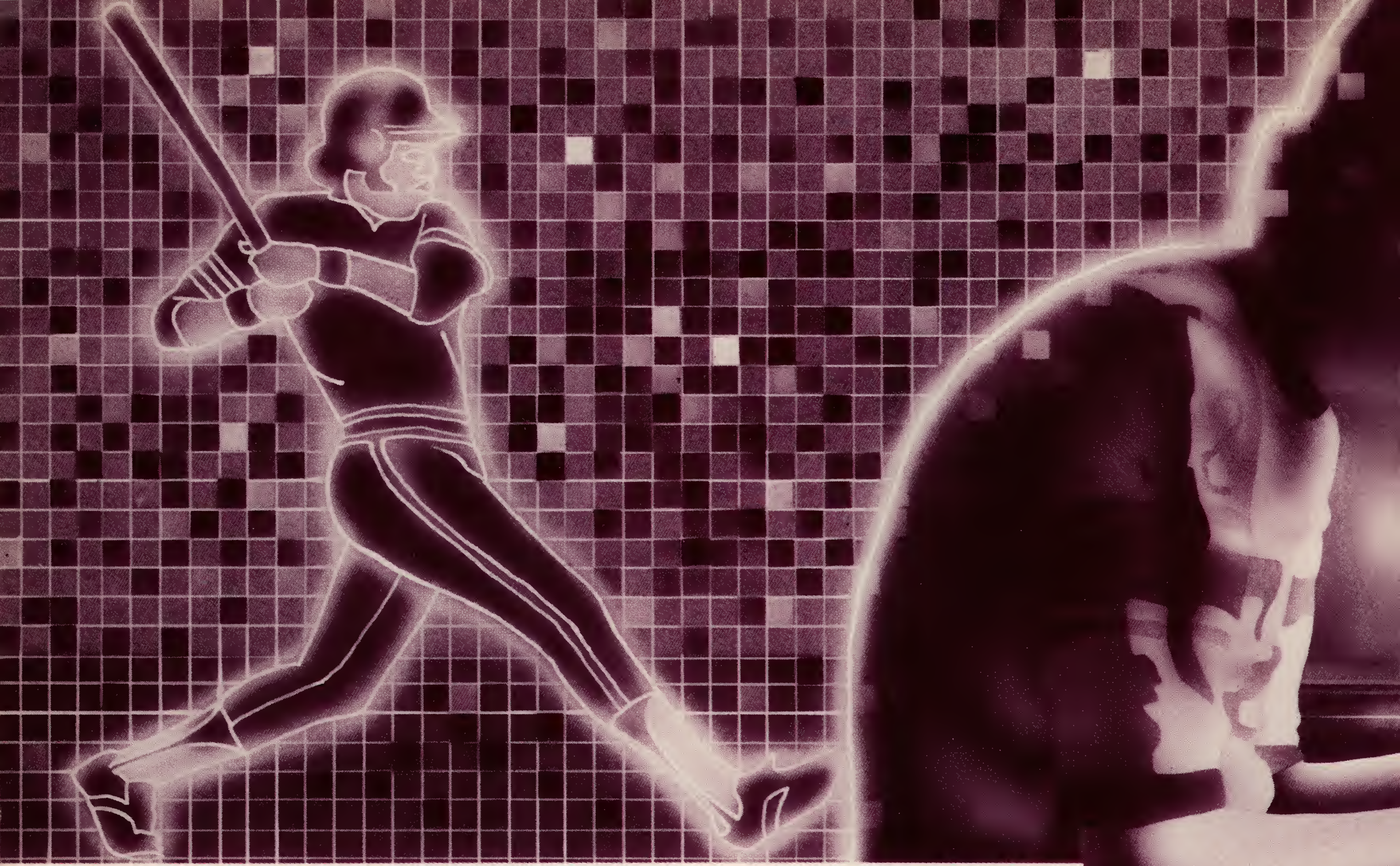
And now for the final test.

If I get into the game after, say, my twentieth death and I still want to do better, and I look at the clock to discover that I can't find my clock anymore, then what else can I ask?

This experience is known as *flow.* Flow, according to Dr. Mihaly Csikszentmihalyi of the University of Chicago, is the reason people climb mountains, make love, play games and chew gum.

My goal is not to make more games, but to get more people to play. I try to create something different because I think that the more different ways a person has to play, the more that person will be able to experience himself as a player in yet a bigger game.

Bernie DeKoven is a senior game designer for Children's Television Workshop and the creator of such hit games as "Ricochet" and "Alien Garden." He lives in Palo Alto, Calif.

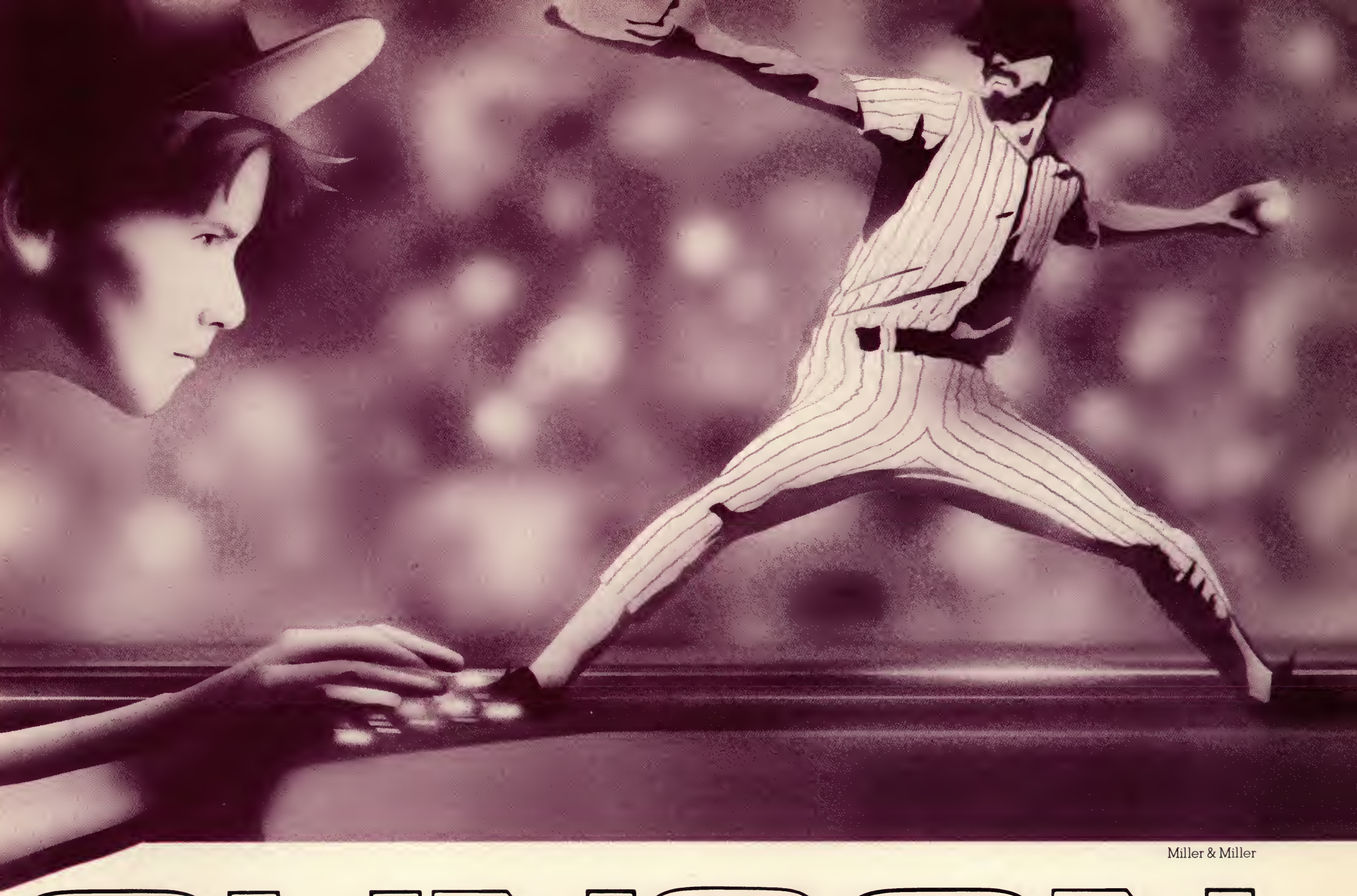


“BABE” J

Computers and sports. Computer games have mimicked sports from their inception — remember "Pong?" And as the ads on television will show you, the games are evolving in their abilities to simulate sports.

Computers and sports. Computers are finding their way into the sports themselves. Computers can graphically analyze the movements of a gymnast, tennis player or other athlete better than a coach's eye. Computers can tell a baseball manager in exactly what situations a player performs best. If a printout says a batter does not hit well against left-handed pitchers with yellow teeth and a wart on the nose, that batter does not play against a pitcher with those features.

What of the future? Will computer games become more like sports and sports become more like computer games? Will the lines between the two blur? Will the distinction between the image on the graphic display and the flesh-and-blood image disappear? Will it matter?



Miller & Miller

OHNSON

Johnny Johnson, age 9

It was 1995 — seventh game of the World Series. The ageless Billy Martin, in his ninth stint as manager of the New York Yankees, had led his team into the final game of the Series against the Tampa Tantrums, in the league just five years — and once managed by Billy in between jobs in New York.

In the pressbox, the equally-ageless Howard Cosell switched on his computer to the program "Basic Baseball" and ignored the data. In the dugout, Billy Martin turned on his computer, which told him the exact inning a temper outburst would have the maximum effect upon his starting pitcher. In the stands, the fans loaded World Series programs bought at the gate into their computer glasses. Hooked into a central data file behind the scoreboard, the programs fed the latest game information to graphic displays superimposed along the bottom rims of the glasses. Cable networks offered "You're the Manager" programming in which subscribers on the interactive channel on managerial moves, tactical moves by the pitcher or other players. A simulation computed the probabilities of success of these moves versus the success of those made by the manager.

Elsewhere, in Peoria, Illinois, baseball fan Johnny Johnson, age 9, switched on his computer. Program "Babe Ruth," his own creation, began running. Johnny checked the biorhythms of the starting players and entered the latest weather information for the game. Cold but clear. When will they finally put a dome on Yankee Stadium? Even the Cubs have a dome.

When all the stats were in, Johnny began to play his own game: How soon could "Babe" predict a winner.

"Hello, Babe."

"Hello, Kid." The graphic image of Babe Ruth on Johnny's computer screen took a bite of a hotdog.

"What's your prediction for the game, Babe?"

"I'd like to pick the Yanks, ya know." The image on the screen wiped a spot of ketchup from the corner of its mouth.

"I know, Babe."

"But I can't this time." Babe hefted a large bat and swung it across the screen.

"Why?" Johnny asked.

"Simple, kid — the numbers show that the Yankees' starting pitcher begins slow in cold weather. Tampa will get a couple runs with their big hitters before he loosens up and finds his groove."

"What about the Yankees' hitting?"

"The gent pitching for Tampa has given up less than two runs every time he's started when there's been a quarter moon. And guess what, kiddo..."

"There's a quarter moon tonight."

"Plus that first baseman for the Yankees — Gehrig."

"No — his name is Wilson."

"Whatever He's got that bad ligament in his right arm — can't follow through on his swing. My batting analysis shows that's where he gets all his power. The Yanks need his power tonight. I wouldn't be surprised if he re-injures his arm in this cold, say long about the fifth inning."

"So you predict Tampa by two."

"That's the way I see it, kiddo."

"Thanks..."

"The Yanks need me, don't they?" The Babe scratched at the dirt with his cleats.

"Yes, they do."

By the sixth inning Tampa lead four to one. The Yankees had men on first and third, however, and Wilson was at bat. The first pitch to him was a ball, low on the outside corner. The second one came in... a fastball high in the strike zone, a perfect target for Wilson. He swung hard missed, let the bat drop and grabbed his right arm. The grimace on his face told of the pain.

Johnny switched off the game. The screen now showed "Babe" standing by the Yankees' dugout. "You called it perfectly, Babe."

"Naw — Tampa is leading by one more run than I predicted." The Babe turned and looked in the stands for a hotdog vendor.

"Let's change things," Johnny said, "Let's you and I play the game over and make it in a domed stadium."

The Babe turned back from the stands. "One more thing."

"Yes?"

"Let me play in this one."

"Sure, Babe."

Johnny Johnson, age 16

February, 2003 — World Series time. However, not the World Series of the major leagues, those remnants from the 20th century, but the new World Series of the North American Computer Baseball Network. Game One — and Johnny Johnson would be starting. Well, not Johnny himself, but the program/player he created would be starting in the outfield. Each member of a team created a program based on a player from the past. The program then was submitted to League officials for approval as being realistic. Then teams held "tryouts" and chose the best "players." The team was directed by a manager program. An overall league program supervised the games.

Johnny played for the "New York Yankees 1927-1932." His program's name was "Babe Ruth," of course.

"Babe, are you ready?" Johnny asked before transmitting the program to the locker room before the game.

"Fine, kiddo."

"How's your head?"

"It felt as big as the moon when I got up this morning, but I hit better that way."

"Were you out drinking last night?"

"Naw, not really."

"Babe, come on."

"Ah, OK, I had a few beers — to loosen up."

"Are you nervous?"

"Naw, kid."

"I am," Johnny confessed.

"That's because it's your first series. I've been through this before. Come on — time to get me to the locker room."

"OK. Good luck, Babe," Johnny said and transmitted the program to the "locker room." Now all he could do was watch.

The images flickered across Johnny's screen. He spotted Babe standing in the dugout. There — the Babe ran out for introductions. The crowd booed loudly. The Yankees were playing the "Los Angeles Dodgers 1959-1964." The Dodgers were "home" team for the first game. Koufax was pitching — and the crowd was eager for him to destroy the legendary Babe. The game began...

Koufax was in top form — struck out the first three men to face him. In the second inning, the Babe came to bat and struck out. The crowd roared approval and hooted at the Babe.

In the third, the Dodgers took a two to nothing lead on two consecutive singles and then a double. The Yankee pitcher, Lefty Gomez, seemed to be fading, but struck out Wally Moon to get out of the jam. Koufax continued to be a blazing terror. The Babe struck out again, and again. Johnny did not touch the bowl of popcorn he had made for himself.

In the eighth, the Dodgers added an insurance run on a pinch hit homerun by Chuck Essegian. Now came the top of the ninth — the bottom of the Yankee order. Babe's chances of coming to bat again were slim. Johnny sighed when Koufax struck out the first man at bat.

But then a miracle occurred—Maury Wills missed a ball. One on with an error. A single moved him to third. Koufax seemed to tire and walked the next man. The Babe was at bat. The crown hooted. The Babe smiled. He did not lift his bat: The first pitch went by — strike one. The second pitch went by — strike two. The crowd booed. The Babe smiled.

Johnny shook his head. He remembered before the season, the time he entered the famous "called homerun" into Babe's database. The League had questioned — no one knows for sure if Babe Ruth had pointed to the spot where he would hit a homerun in that famous 1932 World Series game against the Chicago Cubs. In the end, the league had allowed the data to be entered on the condition that the odds for the Babe calling a pitch and then succeeding in placing the hit be reduced below 10 percent. Would the Babe call the home run shot?

The Babe moved out of the batter's box. He moved in front of the plate and peered out into center field. The crowd roared. The Babe raised his right arm. No doubt existed in this game: The Babe had picked his spot. Johnny slumped in his seat. Koufax looked in calmly.

The pitch — a hard fastball, just a blur zipping across Johnny's screen. The Babe gave a mighty swing. The ball zipped back in the direction it had come, high up this time — right to the spot the Babe had picked.

Johnny jumped up — tossed his popcorn into the air.

The next week, *Sports Illustrated* featured Johnny's program on its cover.

John Johnson, age 29.

Spring training for the 2016 season was John's last chance to break into the major leagues. "Babe Johnson" sat lifeless on a chair beside him. John plugged in the diagnostic tester once more. His programs were the best, he knew. But he had not been strong in robotics. He had received dozens of offers over the years from robotics engineers to join together to create a player. But no, he had wanted to go it alone, do it all himself. "Babe Johnson" was the result, formed of junkyard robot pieces. He received a tryout with the Denver Diodes on the strength of his program rather than his arm. And something was wrong with that arm—"Babe's" throws were curving to the right. Diagnostics showed nothing, again and again. Time had run out—they must leave for spring training in the morning.

2 a.m., John gave up. In frustration, he kicked the mute "Babe" in the right arm. It swung back and forth limply like a pendulum.

No, John thought with horror, now I probably have knocked his arm out completely. He picked up a ball, placed it in "Babe's" hand. He turned "Babe" on. "Babe, can you throw that ball?" John asked.

"Sure, kid."

"Then do so."

"In here?"

"Throw it."

"Babe" threw the ball—through the workroom window. The ball sailed straight and true. The arm was fixed!

Spring training:

"Don't worry, kid," Babe said to John. Then he turned, hefted his bat and hopped up the dugout steps to the on-deck circle.

Back in the dugout, John paced. This was the big test. Babe had performed well in tryouts and now was to bat in his first pre-season game. The other team was bringing in a new pitcher. Denver's manager had motioned for Babe to pinch hit.

The new robot pitcher was ready. John did not watch him. He was lost in that sinking feeling — the same as before his big moment in the Computer World Series years before. His program had done the job then—it had been his greatest moment in baseball. None since had come close. Maybe now.

"Strike one!" That pitcher—the ball came slow but jumped around like popcorn popping.

"Strike two!" Babe looked silly swinging wildly at empty air as the slow ball dipped away from him. The programmers in the dugout were murmuring something. John did not hear. One last chance.

"Strike three!" Babe's bat flopped around feebly, foolishly. John knew they had failed in their one big chance. He heard the programmers exclaiming something behind him.

"What did you say?" John asked.

"He's done it!"

"What?"

"Perfected the Gaylord Perry pitcher!"

"What's that?"

"A robot that can throw a spitball!"

And so John Johnson became the first victim of a robot pitcher that could spit. His career was over—he thought.

John "Babe" Johnson, age 38.

John looked out over the new sports complex built for the city of Detroit. He had helped program the multi-sports stadium for International Sports Machines. The stadium sat on a table at the ISM labs. The complete miniature stadium measured the size of a dining room table.

"Holographics on," a technician behind him said.

"Holographics," John murmured. He had helped do it: Perfect holographic images had replaced live robots in major sports. Now sports were totally in the hands of the programmers. The test began. Images of tiny players and spectators now filled the stadium. On the mound, the pitcher spit into his glove.

John turned away. He was one of the master programmers in the sport of baseball. He had his picture on bubblegum cards. Yet... yet something was missing, something felt wrong. He started for the door.

"Hey, John—where are you going? We're starting to run through the test program," the technician said.

"I have something in my car I want to show you."

"Shall we hold the test?"

"No."

John returned in a few minutes holding a worn, blackened object in his hand.

"What's that?" a technician asked.

"It's a baseball glove. For playing baseball manually. I was walking by an antique store and saw it in the window. I don't know why—for some reason, I felt I had to buy it."

"So why are you bringing it in here? We have a test game to play."

Commissioner John Johnson, age 46.

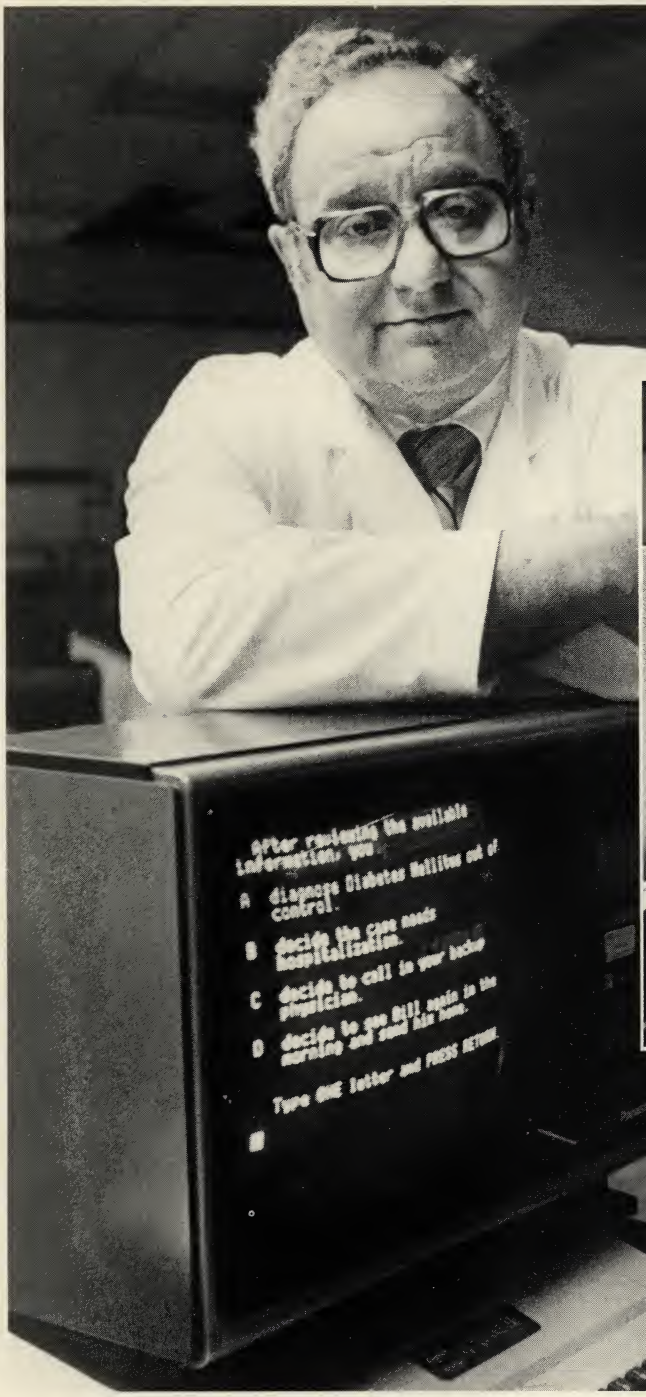
John Johnson, commissioner of the Live Baseball League, sat in the first-base box in Yankee Stadium (thank the heavens it had been declared a historic building and had not been torn down). He was about to throw out the first ball for the first World Series game played by humans in nearly a quarter century.

After years of struggle to find backers, John had founded the league two years before. People had said he would not find humans who could physically play baseball. Even John had been surprised by the number who had showed for the first tryouts. People had said no one would come to the stadiums. John looked around—well, most of the seats were filled.

John threw out the ball and waved to the crowd. With a broad smile on his face, he settled back in his seat to watch the live World Series.

Suddenly, his smile faded. He had heard someone behind him say: "You know, I bet you could put a computer/gyro system inside the ball that could direct the pitches better than the pitcher by himself ... "

Dixon Otto is a free-lance writer from Cleveland.



```
After reviewing the available
information, you

A  diagnose Diabetes Mellitus out of
   control.

B  decide the case needs
   hospitalization.

C  decide to call in your backup
   physician.

D  decide to see Bill again in the
   morning and send him home.

   Type ONE letter and PRESS RETURN.
```

Lee Bernard

Medical game creator Dr. Fred Lotspeich: With an Apple today the doctor can play—and learn.

Marshall University medical students Susann Lovejoy and Dave Josephs play with "Bill:" Computers teach not only information, but an approach to a problem.

PLAYING DOCTOR WITH A COMPUTER

by Dave Peyton

They're computer games, but you're not likely to find them on the shelves of your favorite computer store or in an arcade.

The game action doesn't take place inside a pyramid, a dungeon or a temple. It takes place in a hospital or a doctor's office.

The characters aren't monsters and demons. They're people — common ordinary people who get sick and need a doctor.

The people who play the game aren't seeking treasures. They're not trying to score points. They're learning how to deal with matters of life and death.

The players are first-year medical students at the Marshall University School of Medicine in Huntington, W.Va. The games they're playing on Apple computers are part of their studies. These menu-driven fantasies prove, according to one of the instructors, that computer games are not only for entertainment. Nor are they limited only to the teaching of elementary principles. In fact, they are likely to become an integral part of most graduate education for professionals in the very near future.

Fred Lotspeich, professor of biochemistry at the medical school and the inventor of the game series, knows that the uninformed may charge that medical students are "playing doctor with Apple computers." But that doesn't tell the story nor does it bother him. He already knows the value of the games, although he developed the first one only a few months ago.

His first game is simply called "Bill." When the student puts the "Bill" disk in the Apple drive, the machine plays a few bars of the Marshall University Alma Mater.

"That's just for fun," Lotspeich said. But the computer gets down to business in short order.

The words on the computer screen tell the tale:

Bill is sick. His daughter has brought him to the hospital emergency room. He's suffering from mental confusion and a variety of physical ills.

You are the physician on call in the emergency room that day. It's your duty to find out what's wrong.

That's when the first menu comes to

the screen. You're asked what you're to do first:

1. See Bill
2. Get his medical history from the family.
3. Review his old hospital records.
4. Phone his family physician.
5. Have dinner.

The correct response is to see the patient. But if the student doesn't choose the correct response, points won't be deducted nor will the student fall through a trap door in a dungeon and never be heard from again. Unlike competitive games, this game is tutorial in nature, Lotspeich notes. It tells the student why the choice was wrong and gives the student another chance to make the right choice.

In one case, however, the computer ends the game abruptly, Lotspeich added. That's when the student answers, "Have dinner." The computer announces that the game has ended and adds, "Bon Appetit!"

As the student follows the case of Bill through the computer program, the patient's story unfolds. Bill's primary problem is diabetes. He hasn't been following his doctor's advice and has been drinking a lot. These facts are learned through the proper tests at the proper time in the case plus numerous interviews with the patient over a series of days. These interviews, too, must be done at the proper time, as must the investigations of Bill's medical history.

If a student chooses the right course of action but chooses it too early, the computer will note that the action is called for but other things must be done first.

At a key point in the program, the student must prescribe a certain type of insulin. And that might seem to be the end of Bill's problem. But he returns to complain of the same diabetic symptoms. More tests must be prescribed at the proper time.

Finally, the student learns that the problem isn't caused by Bill's inability to produce insulin. His own insulin is being produced, but it's faulty and not doing the job it's supposed to do in the metabolism of sugar.

But the program does more than just explain the imperfect insulin in Bill's body. It displays graphics of the insulin molecular chain to show where the defect lies. It is this type of versatility which makes the computer invaluable in the area of advanced education, Lotspeich said.

Since Lotspeich is a biochemist, all the games he is developing have some sort of biochemical principle involved.

"It seems that once medical school students get through basic classroom courses such as biochemistry, they tend to believe the basic courses aren't relevant to their clinical experience. These programs teach medical students quite early in their education that biochemistry has applications for the trained physician and that biochemistry will be important to them throughout their entire career," Lotspeich said.

In fact, he noted, the students who are playing these games are getting a practical simulation in clinical experience. "It gives them an excellent idea of what they will run into in the office or the hospital once they begin their residency," he said.

There's no reason these computer games must be limited to biochemistry. In fact, the programmer of the games said there's no reason they must be confined to first year medical students.

Sherri Beck, a technologist in the Department of Biochemistry and the programmer involved with Lotspeich in the development of the computer games, noted that these programs can be written for a 48K machine commonly found in a physician's offices.

"If, for example, a physician wanted a quick refresher course in biochemistry as it relates to insulin, I could see the physician checking this program out of our library and using it on his office computer at his leisure," she said.

But the same program could be modified quite easily and be transformed into a test of knowledge instead of an instructional program.

"There's no doubt that the program could be administered as a test," Ms. Beck said. "In fact, I have just read that some of the specialty medical board examinations will soon be given on computers. Computers are not only able to tally correct and incorrect answers to questions, but they can determine how long it takes for someone to answer a question."

That could be important in medicine, she noted, since quick decisions are imperative in many diagnoses and treatments.

Marshall students who have used the computer games agree that they are a valuable adjunct to the more traditional methods of education.

Cheryl McCarus, one of the students who has used the games, said the "Bill" program and the others like it not only teach information but they teach an approach to the problem.

As any player of computer games will attest, it's virtually impossible to win unless a methodology is developed. The same holds true for these teaching games, Ms. McCarus said. "If you don't have a plan, you're not going to choose the right alternatives. And this method of approaching the problem is the same method we'll be using as practicing physicians."

Ms. McCarus noted that in the past, first-year medical students had two basic ways of learning—reading and lectures.

"This is an entirely new way of learning and for that reason, I think it will be a big help. But while you're learning, you also want to get the right answers. If you keep coming up with the wrong choices from the menus, you know you'd better go back and read some more on the topic."

Thus the games become a yardstick of achievement without the pressures of a test.

Lotspeich said he got the idea for the games from a professional meeting he attended in Canada. The idea is so simple, he's sure this "game approach" to the teaching of medicine will be used extensively in many, if not most, medical schools in time.

The beauty of the game approach is that there is no limit to the programs. "There are probably as many potential games as there are patients seeing physicians in America."

The "Bill" program was taken from the case histories of a practicing internist living and working near Marshall University. It's important to have a practicing physician as a consultant so that the game will imitiate real-life situations, Lotspeich said.

"The students themselves can use the things they've learned in their classes to design their own games. In fact, one of our first-year students designed her own game. It's quite good and we'll probably use it. It was a learning experience for her and will be another learning experience for lots of students who follow her."

Dave Peyton is a newspaper reporter and freelance writer from Huntington, W.Va.

ENHANCING THE TIMEX SINCLAIR DISPLAY

by Fred Blechman

Your Timex Sinclair 1000 or ZX81 is of little value without a good TV display. This article describes some ways to improve the clarity and stability of the display itself, and also covers some programming techniques for formatting characters and graphics on the screen.

The ZX81 connection

Connecting the computer to the TV set can be confusing, so Figure 1 is provided as an aid. Use a black and white TV set. A color set will work, but the display is generally much worse. Use the video game switch provided with the computer. It may vary in exact design from the illustration, but the connections are made as shown. The important thing is that the TV antenna should not be connected to the computer at any time, or you'll be broadcasting the computer signal around your neighborhood — a definite FCC no-no! Both the computer and the TV set should be set to the same channel (VHF 2 or 3), and the video game switch should be set to "game" or "computer" — NOT TV.

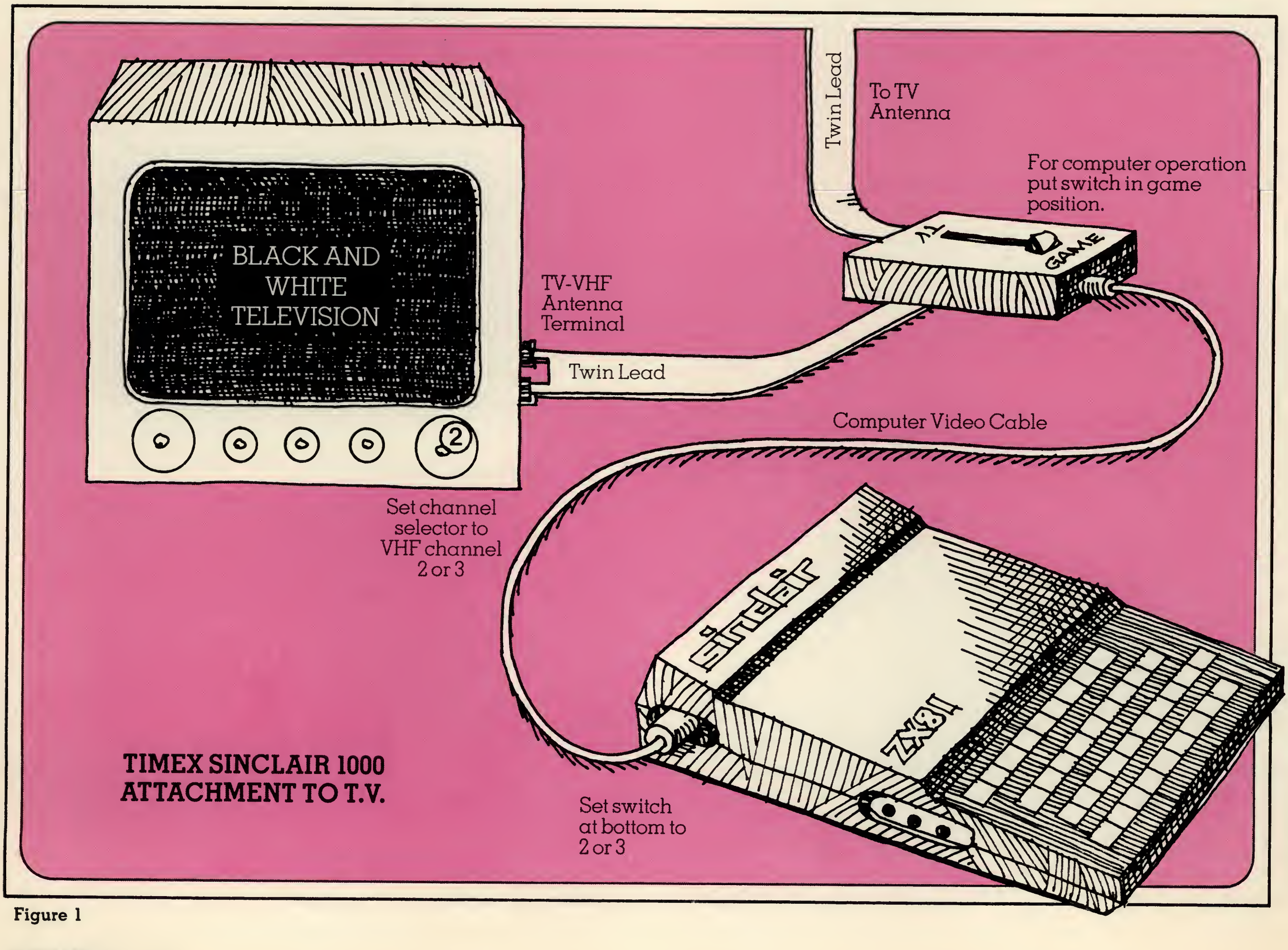
Display limits

With the computer powered-up and the TV on, you should get a white screen with a small black block in the lower left corner of the screen. Look carefully and you'll see a white letter K in the box. This is called the K-cursor. Adjust your TV fine tuning, brightness and contrast controls for the sharpest K. There is considerable interplay between these controls, and the best setting — the sharpest K — is not likely to be the same as you use for a regular TV picture. If you get horizontal pulling or tearing, adjust the TV horizontal hold control. Vertical flipping of the picture will require adjusting the TV vertical hold control. All these controls are usually on the front, side or back of the TV, and sometimes under a flip-out panel. Some TV sets also have an AGC control which can greatly improve the picture. Since there are no external adjustments on the computer, you'll have to do all the "fine tuning" at the TV.

Next you'll want to determine the screen limits and vertical linearity — how constant the character size is from the top to the bottom of the screen. This simple program will fill your screen when RUN:

```
10 FOR X = 1 TO 22
20 PRINT "12345678901234567890123456789012" (32 characters)
30 NEXT X
```

Notice that FOR, TO, PRINT and NEXT are not individual letters; they


BLACK AND WHITE TELEVISION
Twin Lead
To TV Antenna
For computer operation put switch in game position.
TV
GAME
TV-VHF Antenna Terminal
Twin Lead
Computer Video Cable
2
Set channel selector to VHF channel 2 or 3
sinclair
ZX81
Set switch at bottom to 2 or 3

TIMEX SINCLAIR 1000 ATTACHMENT TO T.V.

Figure 1

King Associates

are the "keywords" shown on the keyboard. When you RUN this program, you'll get 22 lines of 32 characters on each line, then a blank line, then the report 0/30 in the lower left corner of the bottom line. This defines the area of the screen you can use. Is the display approximately centered left to right? If not, the horizontal hold will shift it slightly. How about the top and bottom? The vertical size and linearity controls (usually at the back of the set) affect the top and bottom borders and the vertical stretching or compressing of the picture. Adjusting these controls for the best-centered and proportioned computer display will also give you the best TV picture for regualr viewing — no more coneheads or squashed faces!

If all else fails, an you're both brave and careful (high voltages present) you can remove the back of the TV set and you'll find two metal "centering tabs" extending radially from the picture tube neck. These can be rotated slightly to center the picture.

The display layout

Although you can't see them on a blank screen, there are 704 printing locations on the screen for program characters — 22 lines of 32 characters each. These are controlled by the various PRINT commands and may be specified by row (top to bottom) and column (left to right). Two lines at the bottom of the screen are not available to the user; they are used by the computer for line entry, editing and "reports."

Each of the 704 character spaces is divided in four and each quarter is called a "pixel." These pixels (each actually composed of four dots across and four dots high) are used with the PLOT and UNPLOT statements, and their locations are specified with an altogether different layout than the character spaces. Pixel locations use horizontal coordinates from 0 to 63 (reading from left to right) and vertical coordinates from 0 to 43, but reading from BOTTOM to top! Figure 2 illustrates character and pixel spaces and numbering systems, with several examples.

Caution! How's your memory?

The details are beyond the scope of this article, but of vital concern to those with only 1K or 2K of user memory (RAM) is the sad fact that the display contents are part of RAM. The more you display on the screen (including blanks before the end of a line) the less RAM you have for your program! That's why you so often get the 4/XX "out of memory" report as the screen fills. This is not the case with 16K, which allocates a constant space of RAM to the display. Anyhow, don't worry — at least all the programs in this article work with 1K RAM.

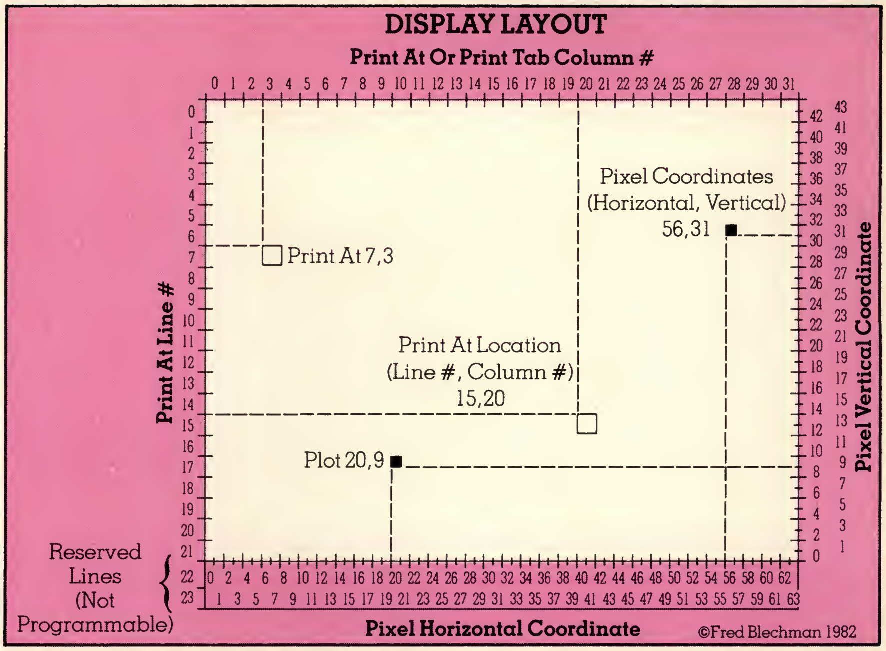


Figure 2

King Associates

The character set

Now that you have a perfect picture (well, acceptable, anyhow) your attention should be directed toward *what* you'll be putting on the screen, and *where*. The "what" are the characters, the "where" is the location of these characters on the display.

The standard "character set" of the Timex Sinclair 1000 and the ZX81 is composed of the alphabet (26 letters, upper-case only), ten digits (0-9); seventeen symbols and punctuation characters, and 11 graphic symbols (counting the blank space)—a total of 64. However, all of these are also availabel in reverse — a white character within a black block—for a grand total of 128. In reality there are 256 "character codes" but many are not used in this computer, and others are used as "tokens" or keywords, as you'll see later . . .

PRINT-,-;

Let's concern ourselves at this point with displaying just the regular characters and numbers — you can do reverse and graphic characters on your own. Refer to Figure 2 for the following discussion.

There are three primary ways to place and locate characters on the screen: PRINT, PRINT AT and PRINT TAB, used together with semi-colons and commas. Look back at the simple program we used earlier. That program prints 22 full lines, with 32 characters on a line, using the simple PRINT statement. But there's more to PRINT than meets the eye! Type and ENTER a new line 20:

```
20 PRINT "TEST";
```

Don't forget the quotation marks or the semi-colon. Now RUN. Surprised? You have 22 TEST words on the screen in less than three lines. What happened? The secret is the semi-colon, which prevents a return to the next line ("carriage return") until the end of the line (32 character spaces long) is reached. Now edit or retype line 20 to this:

```
20 PRINT "TEST    ";
```

(4 spaces after TEST)

RUN and see how nicely the four TEST words on each line are each separated by four blank spaces. You are beginning to practice "formatting." Okay, try this:

```
20 PRINT "TEST",
```

(Don't forget the comma)

RUN this and you'll get two columns of eleven lines of TEST neatly lined up at the left side and center of the screen. The comma following a print statement effectively divides the screen into two "zones," a left half (0 to 15) and a right half (16-31). Very handy for tabulations.

PRINT TAB

But there are even more powerful PRINT statements. Try this new line 20:

```
20 PRINT TAB 8; "TEST";
```

(TAB is a keyword)

This indexes the beginning of the printing to the ninth space from the left (zero is the first space). Notice that the ending semi-colon does nothing in this case, and may be omitted — but don't leave out the semi-colon after TAB 8 or the computer will not allow you to ENTER the line (you'll get an S-cursor at that point in the program line, meaning "syntax error"). By the way, did you have trouble figuring out how to get the TAB function from the keyboard? The functions listed BELOW the keys are obtained by pressing SHIFT and FUNCTION at the same time, followed by the key above the function you want. Don't use individual letters for TAB — it won't work.

Multiple TABs are allowed. Enter this very carefully:

```
20 PRINT "TAKE"; TAB 8; "THE"; TAB 16; "TAB"; TAB 24; "TEST . . . "
```

Four neat columns. Now, the real power comes when you use variables with TAB, for tabulations. Use NEW to erase the program in memory and type in this one:

```
10 LET A=1
20 LET B=2
30 LET C=3
40 LET D=4
50 PRINT A;TAB S;B;TAB 16;C;TAB 24;D
60 LET A=A+1
70 LET B=B+2
80 LET C=C+3
90 LET D=D+4
100 GOTO 50
```

When the counting gets to 88 the screen is full (22 lines) and the 5/50 report shows at the lower left corner. Press CONT and then ENTER to continue. Of course, you can combine text with variables in TAB statements.

PRINT AT

If you liked PRINT TAB you'll love PRINT AT. Refer to Figure 2 again. Delete your existing program with NEW and type in this one:

```
10 LET Y=0
20 FOR X=0 TO 21
30 PRINT AT Y,X; "TEST"
40 LET Y=Y+1
50 NEXT X
```

Be careful that you use the function AT (below the C-key) and not the letters A and T. You may, of course, use fixed values for PRINT AT, rather than the variables in the program above, and the new printing will replace whatever was on the screen. For example, add this line:

```
60 PRINT AT 11,7; "END OF TEST"
```

Any characters (numbers, letters, punctuation or symbols appearing on the keyboard), including their graphic reverse versions, can be used with PRINT, PRINT TAB and PRINT AT. In combination with the semi-colon and comma you can format multiple columns on the screen and selectively "erase" desired areas on the screen using blank spaces.

Character set display

Here's a little program that will display the entire standard character set. First use NEW to delete your existing program, then type and ENTER these lines:

```
100 FOR X=0 TO 255 STEP 2
110 SCROLL
120 PRINT X;" ";CHR$ X,X+1;" ";CHR$ (X+1)
130 SCROLL
140 PRINT
150 NEXT X
```

The character CODE is X and the character (or keyword) is shown by CHR$. The SCROLL before each PRINT forces the new printing to the bottom user screen line and pushes up all lines above it. This eliminates the normal "paging" of 22 lines, and allows continous printing. The SCROLL statement, once used in a program, must be used before each following PRINT statement or you'll get a "5" error (screen full). You can avoid this by using the CLS (Clear Screen) statement after using SCROLL. Line 120 (type it carefully!) puts two characters on a line, and lines 130 and 140 insert blank lines to increase readability.

How about pixels?

Back to Figure 2 again. Each character space is divided into four equal parts, called "pixels." The pixel statements PLOT an UNPLOT use an entirely different coordinate system than PRINT AT, since there are four times as many pixels (2846) as there are character locations (704). The tricky part is that the vertical pixel coordinate counts from the *bottom* of the screen upwards. Furthermore, the horizontal left-to-right coordinate is given first, before the vertical. With PRINT AT the vertical location (row), counting from the *top*, is given first. Nothing like standardization, right?

Well, now that you have that down pat, here's a program to continuously draw and erase a diagonal line:

```
10LET Y=0
20 LET U=0
30 FOR X=0 TO 43
40 IF U=0 THEN PLOT X,Y
50 IF U=1 THEN UNPLOT X,Y
60 LET Y=Y+1
70 NEXT X
80 LET Y=0
90 IF U=1 THEN GOTO 120
100 IF U=0 THEN LET U=1
110 GOTO 30
120 LET U=0
130 GOTO 30
```

The variable U is used here as a "flag." Initially it is set to zero. When the FOR-NEXT loop from lines 30 to 70 is completed the first time, line 100 sets U equal to 1, so UNPLOT is used through the next loop. Then U is set back to zero again by lines 90 and 120 to resume PLOT. The flag keeps flipping back and forth each time the FOR-NEXT loop is completed.

Is that all?

The information supplied here just scratches the surface, but should start you thinking about formatting whenever you have information or graphics to display. Since the printer uses the COPY function to make an exact copy of the display, you have additional incentive to learn formatting to produce more readable reports.

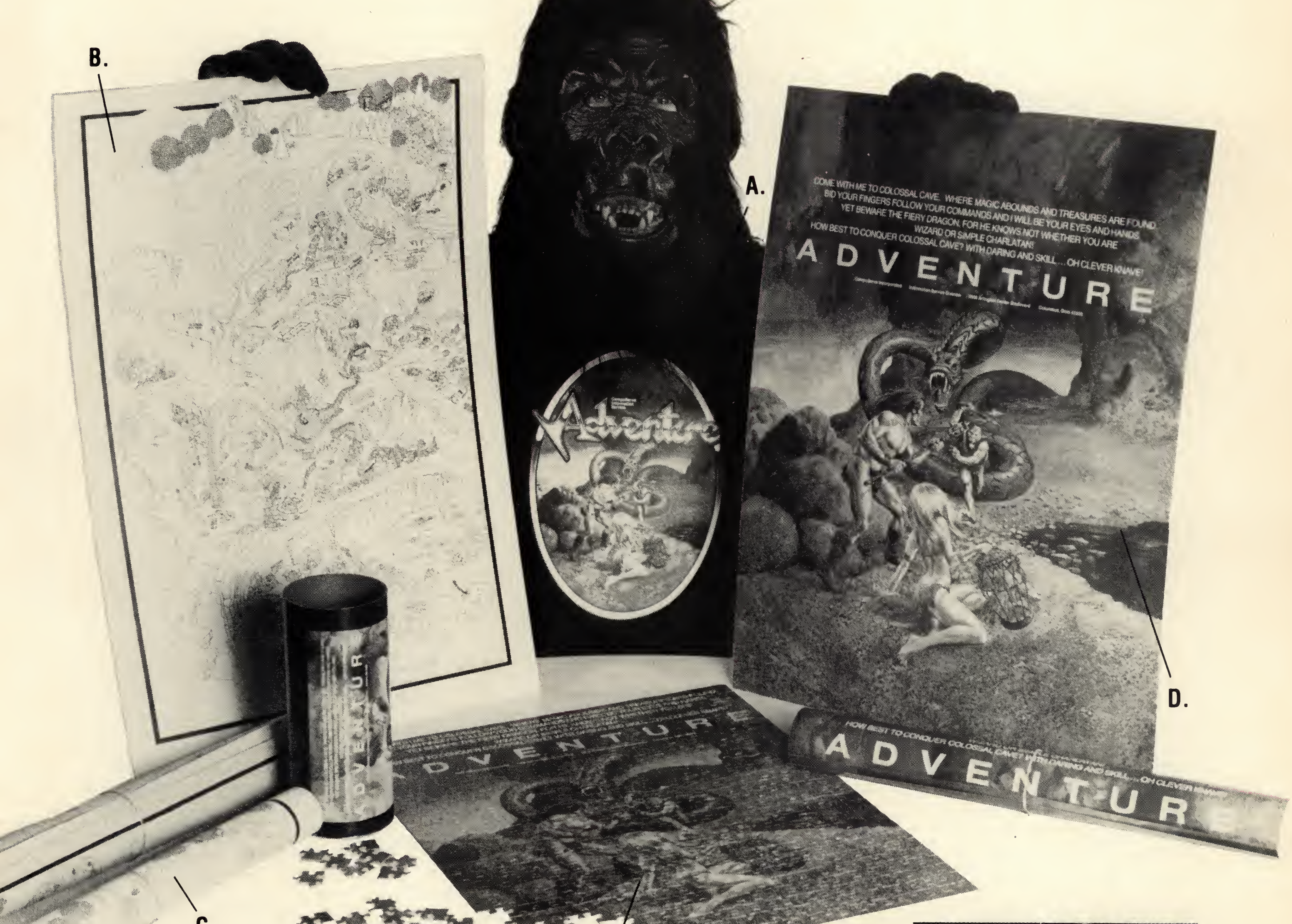
If you only have 1K or 2K of RAM, proper formatting will allow you to display more information with less display space — thus giving you more usable program memory.

There are other ways to put characters and pixels on the screen — strings and POKEs, for example. These may be the subject for a future article — when I figure out how to do them!

Fred Blechman is a free-lance writer from Los Angeles

CALL OF THE WILD

Have you noticed the more you play Adventure the wilder you become? For Adventure Cave veterans and newcomers alike, CompuServe provides the appropriate gear to help you through those hairy situations in Colossal Cave. For example there are maps, t-shirts, puzzles and posters ... just the type of accessories you'll find helpful when slaying fiery dragons. To order your adventure items, send a message via feedback (main menu item 5, User Information). Please allow 4-5 weeks for delivery. Order today!


B.
A.
COME WITH ME TO COLOSSAL CAVE. WHERE MAGIC ABOUNDS AND TREASURES ARE FOUND
BID YOUR FINGERS FOLLOW YOUR COMMANDS AND I WILL BE YOUR EYES AND HANDS
YET BEWARE THE FIERY DRAGON, FOR HE KNOWS NOT WHETHER YOU ARE
WIZARD OR SIMPLE CHARLATAN!
HOW BEST TO CONQUER COLOSSAL CAVE? WITH DARING AND SKILL ... OH CLEVER KNAVE!
ADVENTURE
Adventure
D.
ADVENTURE
HOW BEST TO CONQUER COLOSSAL CAVE? WITH DARING AND SKILL ... OH CLEVER KNAVE!
ADVENTURE
ADVENTURE
C.
E.

A. T-shirts: Available in adult (small, medium, large, extra large) and childrens' (small, medium, large) sizes; cotton/polyester blend. Colors: light blue, kelly green, red, tan, yellow, and black. Cost $8.95.

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D. Full-color poster: Provides Adventure inspiration to even the most travel-weary explorers. Size 18″ x 24″. Cost $2.95.

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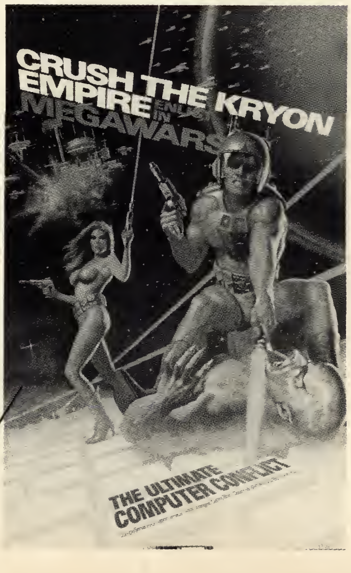

F.
CRUSH THE KRYON EMPIRE IN MEGAWARS
THE ULTIMATE COMPUTER CONFLICT

CompuServe

5000 Arlington Centre Boulevard, Columbus, Ohio 43220

CHOOSING THE RIGHT PRINTER

by William J. Lynott

After several visits to his local computer store and some research in several of the popular computer magazines, Dick Goode decided on the computer that was right for him. That was in September of 1982. Three months later, Dick still had not picked out a printer.

That's not unusual according to computer salesman Dan Wilson. "For some people," he says, "picking out a printer is a thornier job than choosing the computer that will drive it."

The classic dilemma in selecting a printer is the choice that must be made between the two basic technologies: the dot matrix printer for low cost and high speed, and the letter-quality printer for results that approximate that of a good electric typewriter. (To complicate the matter further, both types are available in either the impact or non-impact variety. Because of the lagging popularity of the non-impact type, we'll discuss only impact models here.)

Without being aware of it, most people are familiar with the output of dot matrix printers. They produce that "funny looking" print that is immediately recognizable as computer printing. Most department store bills and many direct mail solicitations are printed with dot matrix machines, some of which are so flexible and fast that they can "personalize" each letter in a run of thousands or even millions.

The reason for the odd appearance of the letters is the manner in which the dot matrix printer operates. Instead of forming each letter as a solid figure the way an ordinary typewriter does, the dot matrix printer "draws" each letter with a series of tiny dots, spaced closely enough together that they approximate a solid figure. Most newspaper photographs are printed with a similar technology. If you look at one closely through a magnifying glass, you will see that areas you thought were solid are actually a series of closely spaced dots. The darker the area, the more closely spaced the dots.

In a dot matrix printer, the dots are produced by a printhead that houses a series of very fine wires, the ends of which strike the ribbon against the paper. Electronics in the printhead determine which wires will strike the ribbon to form each character. In an effort to improve the final appearance of dot matrix characters, manufacturers have designed printheads that use more wires, thus allowing each character to have more closely spaced dots and an image that is denser and more like a fully formed character.

The readability of the characters formed by any of the better quality dot matrix printers is quite acceptable for most computer applications. And, of course, they have that all-important graphics capability which allows them to print pictures and graphics in much finer detail than printers able to print only solid characters. Coupled with speeds as high as several hundred characters per second (yes, that's several HUNDRED), the dot matrix printer is an excellent choice for all-around data processing needs.

However, if word processing or finished documents of fine print quality are the basic need, a letter-quality printer is the way to go.

Letter-quality printers look very much like electric typewriters without keyboards. Instead of responding to the pressing of a keyboard button, the letter-quality printer looks for an electronic signal generated by the computer to determine which characters will be printed. In physical operation, the resemblence to a typewriter is very strong. In place of the familiar "golf ball" in the IBM Selectric typewriters, most of these printers utilize so-called daisy wheel or thimble print elements.

The daisy wheel element, as the name suggests, looks a bit like a daisy blossom with a central hub and spokes that have characters embossed on their ends. The element is mounted in a way that allows it to rotate in response to electrical impulses so that the proper character is in position to be struck by a hammer that will press it against the ribbon, thus forming a character in the same way as a typewriter. The daisy wheel printer produces characters of superb quality, virtually indistinguishable from those of good electric typewriter. Be advised, though, that daisy wheels can be very noisy. The hammer strikes the spokes with no small amount of force, and the rapid speed coupled with the energy released produces a noise that has been aptly compared to that of a 50 calibre machine gun. If a daisy wheel is your choice, you will want to hear it in action before you buy. And remember, the noise will sound less offensive in a busy showroom than it will in a quiet home or office. Sound deadening covers are available for most models, and they do help.

The thimble type of letter quality printer works in much the same way. The printing element resembles a large sewing thimble with the various characters embossed throughout its surface. The thimble spins in response to impulses so that the proper character will be in position when the actuator causes the thimble to be pressed against the ribbon. The effect and print quality is essentially the same in both types of letter quality printers. One obvious advantage of either of these letter-quality print mechanisms is the ease with which the elements can be changed to produce a variety of type styles and sizes.

As you might imagine, the sophistication required to produce a printer that will manipulate a printing element with the precision needed for a letter-quality printer costs money, and that cost is clearly reflected in their price. Furthermore, the required physical movement of the print element as it does its job puts a severe limitation on the speed of these machines, most of which have an upper limit of about forty or fifty characters per second (cps). In the lower price ranges, speeds of 12 to 20 cps are common. While these speeds are greater than many typists could ever hope to muster, they are painfully slow when compared to their more frisky dot matrix cousins.

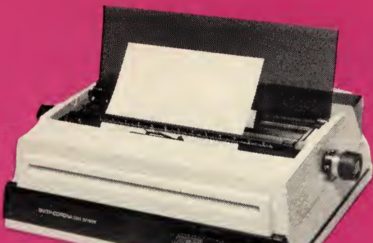
And there you have it. If the bulk of your work will be of the "data processing" variety requiring mostly financial spreadsheets, charts, graphics, or other work that doesn't require fancy printing, your obvious choice is a dot matrix printer. On the other hand, if you need finished documents that will not announce to the world that they were printed by a computer, you need a letter-quality machine. The drawback is that most letter-quality printers are comparatively expensive and . . . painfully slow.

What to do?

People with megabucks can do the obvious and buy both—but, alas, that's not practical for most of us. There is another option, though, and it offers a far better compromise than many people have yet discovered.

In an effort to fill this obvious void in the market, several manufacturers

The Okidata Microline 84 is shown here without the removable tractor feed that is included as standard equipment.



The Smith-Corona Model TP-1– The first letter-quality printer with a price under $1,000.

The Centronics 122 dot matrix printer with graphics.

Letter-quality printers from NEC.

have come up with dot matrix printers that print in two different modes: standard dot matrix, plus an enhanced mode called near letter-quality or correspondence quality. Among the available models are the Microprism dot matrix printer by Integral Data Systems, and the MP Mary Peter 150 by Micro Peripherals, Inc.

The OkiData Model 84 is another of this new breed. It offers standard dot matrix printing at a whopping 200 cps, and correspondence quality at about 50 cps for when neatness counts.

The Model 84 is by no means inexpensive (list price $1395 for the parallel version, $1495 for the serial), but it is a quality machine with a reputation for ruggedness and dependability. More important, it offers high quality dot matrix printing in the data processing mode, plus a "correspondence quality" that would pass inspection by all but the most jaundiced eye.

Housed in a neat, modernistic cabinet that happens to complement my IBM PC in color, the 84 is a trim 36 pounds and a tad smaller in overall size than an IBM Selectric typewriter. Preparation for use was a snap following the clear and grammatically correct instructions in the owner's manual (not always the case with equipment manufactured in Japan). Quality workmanship and precision are evident throughout.

The versatility of this machine is truly remarkable. If comes with a graphics program built right in, plus a choice of six different pitches (number of characters per inch), enlarged or condensed printing, a choice of printing at six or eight lines to the inch, and the ability to do underlying, subscripts and superscripts.

In addition to the conveniently side-mounted on-off switch, there is only one small bank of front panel controls. These control such functions as setting the top of the form, and advancing the paper a line or a full page at a time. All other printing functions are controlled electronically through the software in use.

After reviewing the documentation for both the printer and my Easy Writer 1.1 word processing program, I was able to program all of the necessary commands to get the printer to do exactly what I wanted it to do. The user commands provided in the software make it possible to switch between standard printing and correspondence quality with but a single keystroke. Ditto for underlying, a neat trick with dot matrix printers. The tractor feed mechanism supplied as standard equipment is a joy of simplicity and ease of use.

The manufacturer's literature claims a mean-time-between-failures (MTBF) of 4000 hours. This, of course, is a statistically computed average and not a guarantee that each individual machine will go that long between repair jobs. Nevertheless, it is a figure that suggests a good long time of use uninterrupted by the need for service, and one that is in line with the OkiData reputation for reliability.

There are some problems, of course. Users who would like to use single sheet feed — printing on custom letterheads, for example — will be disappointed. While it can be done, single street feeding is awkward and slow on the 84. Okidata really ought to consider the minor modifications that would make hand feeding of individual sheets a little easier.

Another puzzle involves the ribbon. Stern warnings from Okidata engineers caution against the use of any but genuine Okidata ribbons — because of the special lubricating quality of the ink used, they say. The trouble is that several dealers in the Philadelphia area did not have the ribbons in stock, and a phone call to the company revealed a bit of a supply problem. That should be cleared up by the time this reaches print, but you may want to check if you are thinking of buying any of the Okidata line.

Aside from these relatively minor problems, the Okidata Model 84 gets a gold star.

Would the 84 be the right printer for you?

Well, as anyone who has braved the marketplace to shop for a printer will tell you, only YOU can decide that. Your printer will probably be the most expensive peripheral you will buy and, indeed, might well be more costly than your basic computer. In general, prices will range from several hundred to several thousand dollars — an investment that calls for some careful shopping on your part.

Service availability should be a high priority in your choice of a printer. Along with your disk drives, it is the part of your system most likely to require service. You should find out before you buy exactly who will provide service if you need it, and how much it will cost.

Please insist on actually seeing and hearing a printer in action before you buy. And be SURE to look at the finished product. The quality of printing, even among printers of the same type and class, varies significantly among different makes.

Only by acquainting yourself thoroughly with the range of available choices will you be able to decide which printer is exactly right for you.

William Lynott is a free-lance writer from Philadelphia.

NINE FROM SIERRA:

A Review of Nine Computer Games Form Sierra On-Line, Inc.

by Ernest E. Mau

"Software galore!" That might be the motto of Sierra On-Line, Inc., a major software supplier for popular personal and small-business computers. Formerly known as On-Line Systems, Inc., the company markets both recreational and professional packages for computers like the Apple II, Atari, and IBM Personal Computer.

Among games, Sierra has, as the saying goes, "something for everyone." Under the trade names SierraVision and SierraVenture, programs range from fast-action arcade battles to slower paced, thought-provoking adventures.

To demonstrate the diversity, let's examine some examples. This article looks at nine Sierra games — six arcade types and three adventures. This is not the entire line, but only a few programs selected more or less at random. Regrettably, space allows only superficial overviews. In each case, tests were on an Apple II Plus, though versions often are available for other computers.

Pest patrol

Pest Patrol by Mark Allen, is a novel approach to defeating invaders. Here, cans of insecticide destroy hordes of invading insects. Swarms of bugs swoop across and down the screen with fleas, beetles, snails, "waldos," spiders, worms, and the infamous killer butterflies. They come alone and in swarms, attempting to destroy the player's spray cans. Each is deadly, and contact costs a can — some even home in on the can. All drop "bombs" — there are simple bombs, homing bombs, time bombs, and, worst of all, homing time bombs. To keep things interesting, beetles scurry across the ground when they touch down, still as deadly as ever, while spiders go merrily bouncing around the screen to pounce on the unwary.

With various actions and 40 skill levels to set or earn, one would expect vast possibilities to enchant a player for hours. However, there are some serious drawbacks. The most disturbing is repetitive play. The game is predictable, particularly at the lower skill levels, and individual swarm patterns can be knocked out easily once patterns are recognized. Often, the sequence of swarm appearances can be predicted, thereby positioning the insecticide where it will be most effective when the bugs appear. It's enjoyable for a while but may quickly become boring for experienced arcade players.

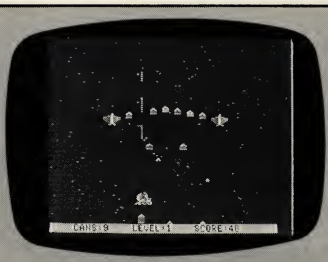
Pest Patrol is playable from the keyboard, a joystick, or a paddle. It responds quickly and smoothly, though the keyboard controls (15 of them) take time to master. The sound effects are interesting but can grow annoying, so there is a provision for switching off the noise. The graphics aren't ideal. While animation is smooth and fast, it's difficult to differentiate fleas and beetles. Color bleeding has been a problem, causing a blurry appearance and adding to the problems of identifying fleas and beetles during combat. The game actually is more enjoyable on a monochrome screen than in color—one of the few in which this is true.

Jawbreaker

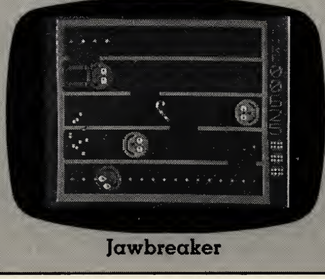
Jawbreaker by "Chuckles" has adorable graphics with smooth animation and interesting sound effects. The first impression on starting up was, "that's cute." It's a fun game, especially for anyone with a sweet tooth. The player maneuvers a set of insatiable teeth through a candy shop, gobbling sweets and playing tag with a bunch of rowdies. Points are awarded for eating the treats and tagging the computer controlled faces that represent the other kids in the store. But be careful! Tag a face or get tagged by one without having eaten an energizer, and the brats literally knock your teeth out—you even get to watch your dental work crumble slowly to the floor.

As play progresses, there are other interesting effects. Between screens full of sweets and playmates, there's a pause to get your teeth brushed. There even are periodic trips to the dentist's chair, though there doesn't seem to be much obvious effect from them. The pace is fast and furious, and a player can't hesitate without risking the loss of teeth.

Keyboard, joystick, and Joyport controls are available. With keyboard control, the player even gets to choose the key patterns, so a little practice quickly reveals a comfortable key pattern. Joystick control seems slightly sluggish, but it's not bad. However, under any mode of control, a movement can "lock" into the system, causing the teeth to duck through the next available moving door when it sweeps past. Without careful attention to the controls, it's easy to pop through a door and right into one of the faces — if not energized, that costs a set of teeth.



Pest Patrol

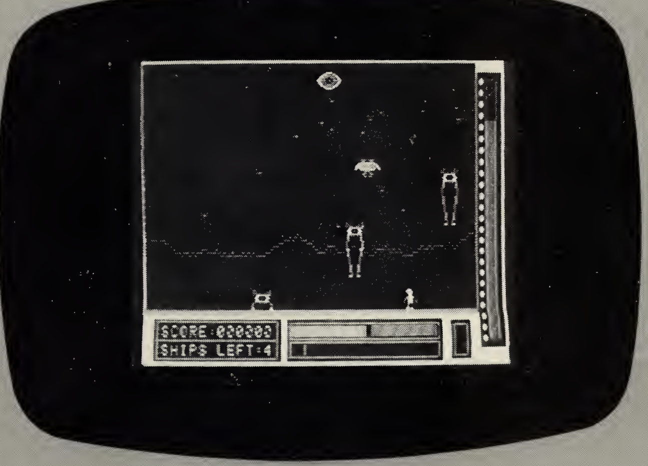


Jawbreaker

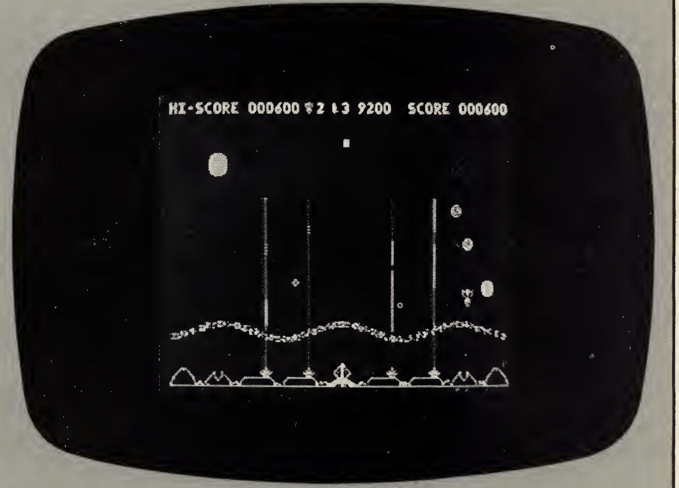
Ten starting skill levels are selectable. The lowest is a special "teddy-bear" level for young children, slowing the action and allowing them increased enjoyment. The only drawback of note is that low-level games are repetitive, at least during the early stages. Patterns of movement, eating, and tagging can be developed and used over and over again. As skill levels increase, however, patterns become less and less noticeable, and the chances of following a predetermined pattern decrease. The game is delightful, though young players are likely to enjoy it most.

Lunar Leeper

Trash compactors on pogo sticks! That's a fair description of the *Lunar Leepers* that are the primary opponents in this arcade game by "Chuckles." The hungry Leepers dominate the lunar surface, chomping stranded explorers who await rescue by a spaceship. Those same Leepers grab careless rescue craft, consuming those



Lunar Leeper



Maurauder

that venture too close. The object is to rescue all the stranded explorers, without killing too many Leepers, allowing the ship to penetrate an underground cave in search of a giant shooting eyeball and its guardians.

This is two games in one—a surface battle against the Leepers and an underground battle against the denizens of the cave. Unexpectedly, the surface engagements are the toughest, and the underground battle is comparatively simple. The eyeball's defenses aren't particularly effective, and achieving the "kill" is simple compared to surviving the surface action.

Eight levels of play provide automatic progression to greater challenges each time a complete surface and underground cycle is completed successfully. Ship movement and weapon firing are controlled by keyboard, joystick, or Joyport. However, just dodging or shooting opponents would be too simple. You also have to contend with fuel supplies that run out quickly and a problem of inertia in which motion in a given direction must be overcome slowly by reverse thrust. It's easy to apply excess thrust and not be able to reverse quickly, thus overshooting the mark and ending up in a Leeper's disposal mechanism.

The graphics are nicely done, and the animation is smooth and constant. Sound effects are not overbearing. Though the sound can be switched off, noises enhance this game and serve as early warnings of approaching too near Leepers and triggering upward jumps. This game is fun—one might even say captivating. It should provide hours of enjoyment for even jaded arcade players.

Marauder

Another two-in-one game is *Marauder* by Rorke Weigandt and Eric Hammond. In part one, the player's invading spaceship must neutralize and penetrate planetary defenses. Those defenses include lasers, missiles, homing mines, and indestructible homing fireballs, as well as a force field above their launching sites. Once the defenses are defeated, the ship may land in the ruins and commence the second part of the expedition.

Part two takes place on foot in a maze-like city, pitted against the clock and killer robots in a search for the power source. The maze isn't particularly intricate, but you can't see a robot until your vision is unobstructed by walls or objects, so the enemy has the advantage of surprise.

Marauder can be controlled from either the keyboard or a joystick. The keyboard requires two hands, with eight keys for the first part and six for the second, so it requires some practice. Joystick control is effective for the first part, but sluggish and difficult in the second, particularly for firing weapons.

In an unusual approach, the two parts can be played independently. Either part one or part two can be cycled repetitively, or automatic progression from one to the next and back again can be selected. There are 16 skill levels, of which ten can be selected, but the six highest must be earned. This allows skipping low skill levels already mastered. At higher levels, this game gets downright mean, and it takes considerable coordination and manual dexterity to play it.

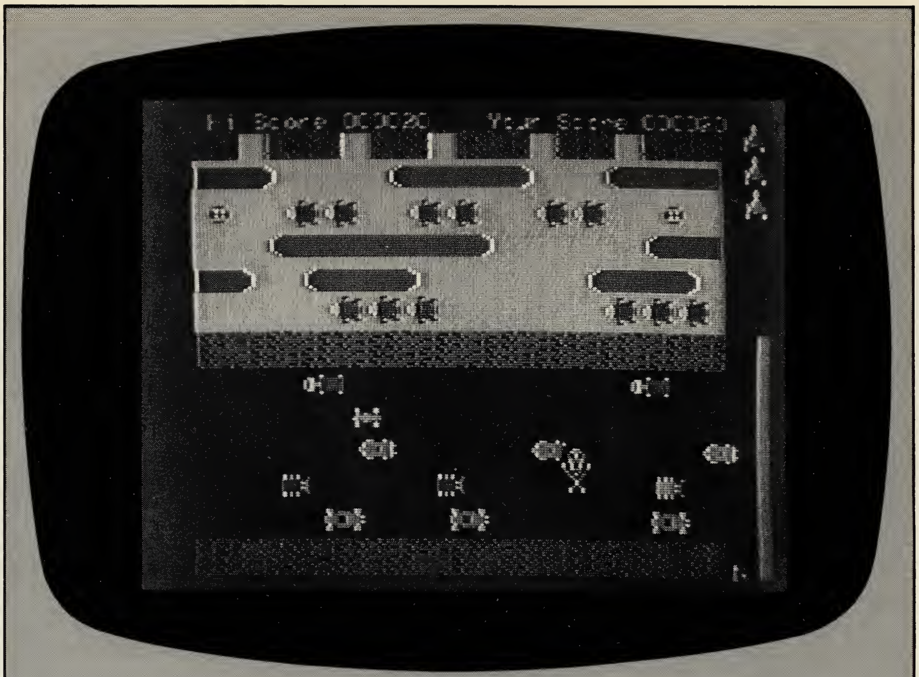
Once again, animation is good, especially at high skill levels where things move fast. The sound effects aren't distracting, but they can be switched off if they do become bothersome. The game is well implemented, attractively presented, and challenging enough to keep players involved. Getting the basics is simple, but mastery of this game is difficult.

Frogger

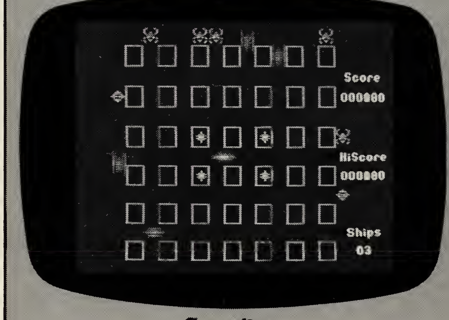
Frogger is trademarked and copyrighted by Sega Enterprises, Inc. Sierra On-Line's Apple version was prepared by Olaf Lubeck. Essentially, it's the popular video and arcade game.

The object is to hop a frog across a highway dodging moving vehicles, then across a river by jumping onto logs and turtles, eventually reaching home on the opposite bank. Placing five frogs on the opposite bank earns a new setup of higher complexity. Points are gained by attracting a female frog, capturing insects, and so on. Obstacles include not only the vehicles on the highway but sinking turtles (this frog can drown), deadly snakes, hungry alligators, and others.

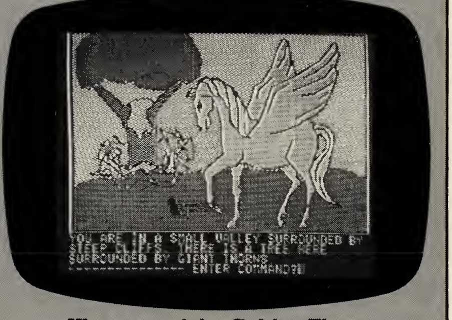
On first impression, the game looks trivial and simplistic, but actual play



Frogger



Crossfire



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YOU ARE IN A SMALL VALLEY SURROUNDED BY
STEEP CLIFFS. THERE IS A TREE HERE
SURROUNDED BY GIANT THORNS
--------------------- ENTER COMMAND?
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Ulysses and the Golden Fleece

soon proves addictive. It's not easy to get the frogs across, and each new screen adds more barriers. About the time you get comfortable with a pattern, up pops an alligator to snatch the frog off the end of a log. And there's nothing quite as frustrating as hopping onto a turtle only to have it sink while there's nowhere else to jump.

There's an interesting sensory/motor interaction that occurs as the frog moves up the screen. It's not hard to move across the stationary highway and dodge the vehicles, but the transition to hopping onto moving objects while avoiding other moving objects does strange things to one's coordination. The biggest problem is tweaking the wrong key and plunging headlong into the water. A player has to overcome almost reflexive actions when changing from highway to river.

The Sierra On-Line version plays extremely well when controlled from the keyboard. Joystick control is possible but generally not satisfactory. The program doesn't want to respond to the joystick unless the stick is returned to dead center after each hop. This particular game doesn't benefit from a joystick on an Apple II. Incidentally, the user may define the keys according to individual preference or accept the default keys which require two-handed operation. Using keys, response is fast, positive, and smooth.

Graphics, animation, and sound effects are excellent. However, the colors may cause problems if playing on a monochrome monitor. When converted to line patterns for monochrome display, some of the objects merge into others. It's almost impossible on a green-phosphor screen to tell orange logs and turtles from the blue water because the lines mesh and objects literally disappear.

Crossfire

If you're looking for challenge, Jay Sullivan's version of *Crossfire* may be just the thing. In the center of a city, you're surrounded on three sides by hostile aliens. Movement is confined to a small area, simulating city streets around blocks of buildings. Quickly, the aliens converge, moving toward you and filling the streets with deadly missiles. You have only your agility and a limited number of missiles to keep you alive. One wrong step catches you in a devastating crossfire from which there's no escape. It reminds one of an updated version of the old movie shoot 'em ups.

Points are gained for knocking out aliens and for crossing occasional bonus markers. It's also necessary to restock missiles when you run low, while dodging aliens and alien missiles. The action is fast, and you often feel helpless as the enemies converge. This game plays at a fever pitch and you have to look in every direction at once. It doesn't seem highly repetitive, so a pattern of motion or firing isn't always reliable. Besides, step one square too far, and the pattern is broken.

Again, the game is playable with keyboard or joystick. Two hands are needed for the keyboard, with the left controlling missile firing while the right controls movement. The keyboard is mastered easily and provides reliable fast-response control. A joystick is another matter. The same stick controls both movement and missile firing, with missile direction determined by pressing the button and pulling the stick in the direction to fire. The problem — pulling the joystick fires a missile but also may register as a command to move in that direction. Unintentionally, you can move right into an alien or a missile. Joysticks require a delicate touch and careful adjustment but still don't serve as well as the keyboard.

As usual, the graphics are excellent and the animation is great. Everything moves smoothly and quickly, so a player can become absorbed in the game instead of the graphics. Running up high point scores isn't hard, but long-term survival is a difficult objective. If any of the Sierra On-Line games are likely to cause a player to fill the air with blue language, this one is it.

Ulysses and the Golden Fleece

Bob Davis and Ken Williams are responsible for *Ulysses*, an adventure game that provides a change of pace from arcade games (Chris Iden did the Atari conversion). The player takes the part of Ulysses and goes on a quest for the legendary Golden Fleece. Throughout the search, there are many obstacles to overcome, mysteries to solve, and enemies to defeat. Even the mythological gods stand in the way.

Like most adventures, the challenge lies in finding actions that work in particular situations. How to buy a weapon? How to pass a guard? What to do when meeting a king? What to do with a dead condor? Such puzzles go on and on, and it's up to you to find the answers. Do the wrong thing, and sooner or later it's likely to cost you dearly.

The game is well designed, though the graphics are a bit crude at times. Perhaps the most annoying feature, though common to games of this type, is that the graphics slow the pace. Each screen takes several seconds to complete, during which the player is idle. This can lead to impatience, especially of repeating actions or retracing earlier steps.

There's also a minor difficulty with messages not being limited to available space below the pictures. They often have to scroll, and it's easy to rush a command before all descriptive lines have been displayed. The result is a rapid sequence of annoying beeps to remind you to finish scrolling the message before issuing a command.

One of a series of "hi-res adventures," the game is enjoyable, though I'm not too fond of the mixed mythologies. It was not Ulysses (Odysseus) who searched for the Fleece; that was Jason and the Argonauts. While the cyclops and sirens in the game relate properly to Ulysses, other objects do not. Pegasus, the fabled winged horse, relates to neither. I suppose it's not all that big a point, and writers are granted some license, but the game might have been more effective had it followed one myth or the other more closely.

Time Zone

Taking on a game of *Time Zone* is an ambitious project. Written by Ken and Roberta Williams, this is an expanded adventure on both sides of six diskettes. According to the literature, there are some 1,300 rooms with more than 1,400 hi-res pictures. The game itself moves through more than a half dozen time periods from pre-history to the far future, and action goes from continent to continent and civilization to civilization.

Each of 40 scenarios is a game in itself, depending to some extent on successful completion of some other scenario if only for specific items that must be transported from one to another. *Time Zone* is not a beginner's adventure, and a novice can quickly become lost in time and space. Just getting started and choosing the right time and the right place to begin the adventure can be a bit of a problem, and some newcomers spend hours trying to figure out how to activate the time machine.

The game cannot be rushed. Patience and perseverance are needed, and nearly every step requires thought. Still, *Time Zone* carries some of the problems of *Ulysses*. The graphics aren't the most delightful things to look at, though they are colorful. However, the full-page graphic displays do impose time delays that can become annoying when retracing one's steps or re-playing a section.

Time Zone provides a good challenge for those with enough time to pursue it. But it does take time — a lot of time.

Ultimate II: Revenge of the Enchantress

Ultima II, by Lord British, probably is the single most challenging game in the Sierra lineup. The original *Ultima* (not provided by Sierra On-Line) was an extremely popular game. Now, *Ultima II* provides a sequel, with numerous improvements over the original.

Where the original limited the player to one world (with a jaunt in space) and one time period. *Ultima II* expands into the solar system and across several time periods. It also has improved graphics in the dungeons, making it more enjoyable, and it adds above-ground towers with their twisting mazes and mighty foes. There are fewer castles and towns, but there are more problems and courses of action in each. Advanced weapons can be purchased, but they can't be used until the player is suitably experienced and strengthened, meaning that combat situations are more balanced.

Ultima II is more than a simple "kill creatures and take treasures" game. Every action or advance requires both thought and experimentation. No longer is it possible to increase one's attributes just by surviving. Instead, it's necessary to find a means by which those attributes can be enhanced. Once found, the means don't even work all the time.

This is a game in which to get pleasantly lost. The graphics and sound effects are enjoyable, and there's so much variety that one always has the feeling something has been missed. *Ultima II* has to rank as one of the top adventure games available, and it's a worthwhile investment for all gamers who like puzzles, tricks, and subtle deceptions.

Conclusion

From just this sampling, it's obvious that Sierra On-Line can satisfy almost anyone's taste in games. They have a wide selection of both arcade and adventure styles. Thus far, this reviewer has yet to have a Sierra disk fail or to get one with major programming errors. That's more than can be said about some suppliers who use customers to debug programs through a process of identifying error after error to obtain replacement diskettes.

One notable problem is worth mentioning, however. Sierra arcade games sometimes won't boot easily. This hasn't been evident in the adventure games, but each arcade disk has, at various times, refused to boot. On visiting local stores, they were experiencing the same problem, often having to try several startups before being successful. It may have something to do with the copy protection scheme being used, because the diskettes appear highly sensitive to drive speed. In many cases, a non-booting disk becomes operational once the drive speed is adjusted.

Buffered keyboards occasionally cause difficulties. The buffer locks in an extra command, temporarily disabling some function. This is common in *Ultima II*, where the escape key to swap disks may not be recognized because there's some prior character stored. It's necessary to clear the buffer by whatever means the buffer supplier recommends, then try again.

Additional information on these and other games may be obtained from Sierra On-Line, Inc., 36575 Mudge Ranch Road, Coarsegold, CA 93614, (209) 683-6858.

Ernest Mau is a technical consultant and free-lance writer from Denver.

SOFTWARE TOOLKIT FOR MICROCOMPUTERS

Edited by Max J. Schindler
$14.95 Published by Hayden Book Company
Reviewed by
Scott Loftesness

The 1980's have been proclaimed the "Software Decade" in anticipation of the major advances expected in computer software design and implementation. Recent announcements such as Apple Computer's new Lisa and Epson's new QX-10 personal computers have emphasized the increasing importance of sophisticated yet easy to use applications software. Indeed, innovative new software designs will likely be one of the keys to success in the computer marketplace of the 1980's.

Software Toolkit reviews a wide range of subjects in the areas of software design, high level languages, and microcomputer operating systems. This new book, a compilation of recent articles from the pages of Electronic Design magazine, includes a complete survey of current topics in these important areas. Unlike some other "Tool" books currently on the market, *Software Toolkit* does not contain any practical programs of value to the personal computer user.

Particular emphasis is placed on microcomputer operating systems. A comprehensive chart (updated for 1982) has been microcomputer operating systems. Operating systems which offer concurrency to support real-time applications receive particular emphasis in articles on Intel's iRMX 86 Operating System and the iRMX 88 Executive. Portability of an operating system is discussed in an article on the UCSD p-System while the performance benefits of a native-code compiler implementation are reviewed in an article written by the authors of Microsoft's Pascal compiler.

A wide variety of microcomputer languages and programming developing tools are covered in detail. Articles on Forth, PL/M-86, and BASIC all review the unique characteristics of each language and applications that match. The new Department of Defense language, Ada, receives special attention with a series of articles on some of its more important features. A final chapter reviews the impact that software can have on the hardware design of systems.

The book lacks an index which would have improved its utility as a reference. Technically oriented readers will find the book particularly interesting for the broad perspective it brings to these important areas. Like other books based upon previous magazine articles, it's a like a patchwork quilt—best read in bits and pieces as they strike your fancy.

CP/M REVEALED

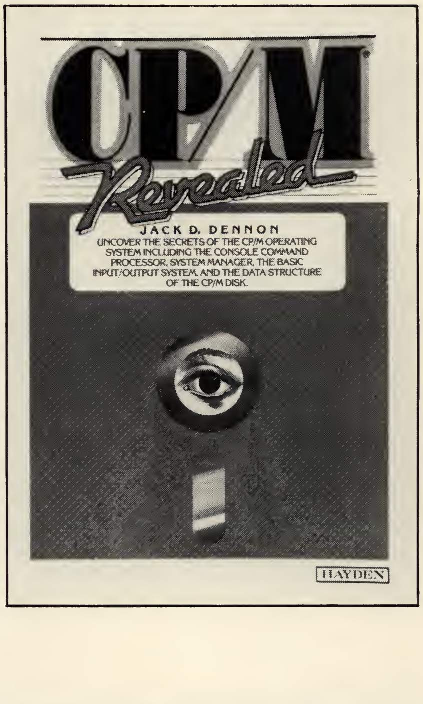
by Jack D. Dennon
Hayden Book Company
Rochelle Park, New Jersey
180 pp., $13.95

Reviewed by Mark S. Gerber

CP/M *Revealed*, in the author's words, is based "... on the assumption that the reader may have no prior computer experience but does have access to an 'up and running' CP/M system." After reading this in the preface, I was expecting to be bored from reading about DIR, ERA, REN, STAT, etc. Instead, I was surprised to learn that the primary programming tool used in the book is assembler. At last, I thought, after religiously avoiding learning assembler, I was going to learn about it in an easy, elementary fashion. Unfortunately, this did not turn out to be the case.

Dennon's book begins at an elementary level by describing what the cursor is and how to enter information. He quickly takes the reader through an exercise on writing a Q&A program in BASIC. Before you know it, the author has you using the DIR command and into the fundamentals of the CP/M editor. By the time you hit page 17, you're doing exercises in assembler language and using DDT — a very ambitious undertaking indeed for the reader with no prior computer experience.

And therein lies the weakness of the book. Although the author states that it is directed to beginners, no explanation or background about assembler programming is provided and blind faith is required to continue reading and doing the exercises without being provided the necessary information to understand what is happening. On the other hand, the reader who already knows assembler will be bored by the repetition. In chapter 10, Swapping Disks, for example, after numerous examples and exercises in assembler, Dennon writes, "To learn how to mount and dismount a disk in the disk drive, either ask someone to show you how or review the directions provided by the manufacturer or system integrator." The beginner will find this misplaced direction frustrating and the more experienced reader will find it annoying.

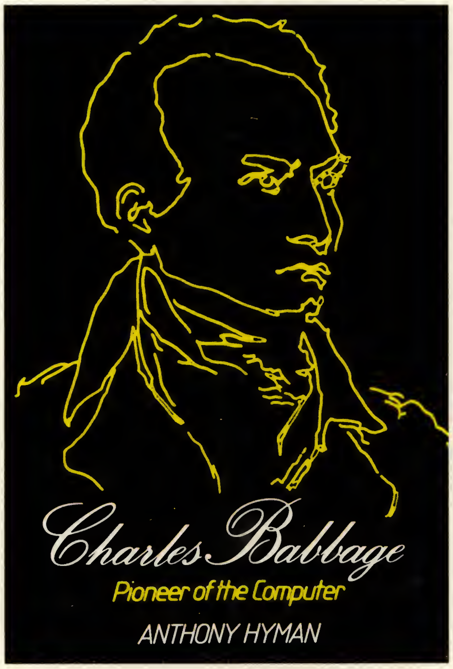

CP/M
Revealed
JACK D. DENNON
UNCOVER THE SECRETS OF THE CP/M OPERATING SYSTEM INCLUDING THE CONSOLE COMMAND PROCESSOR, SYSTEM MANAGER, THE BASIC INPUT/OUTPUT SYSTEM, AND THE DATA STRUCTURE OF THE CP/M DISK.
HAYDEN

If *CP/M Revealed* is for anyone, it is for the person with a "feel" for the structure and commands of assembler and experience with CP/M. The program examples given can form a basic set of CP/M tools. However, most of them are available from other sources, such as the CP/M user group. *CP/M Revealed* tries and fails to be all things to all readers. The organization and editing of the book is sloppy — chapter summaries list information that is not contained therein, the substitute command of DDT in chapter three, for example. A clearer focus and better editing are sorely needed in this book, which fails to reveal what it promises about CP/M

CHARLES BABBAGE Pioneer of the Computer

by Anthony Hyman
Princeton University Press
287 pp. $25.00

Reviewed by Carole Houze Gerber



Known as the unsung hero of the computer, Charles Babbage, born in England in 1792, was a man ahead of his time. At Trinity College, Cambridge, his studies led him into a critical examination of the logarithmic tables used in making accurate calculations. In 1822, he embarked on the construction of a machine for the purpose of calculating logarithm tables.

A paper about his achievement, "Observations on the Application of Machinery to the Computation of Mathematical Tables," received the first gold medal awarded by the Royal Astronomical Society. Babbage called his machine a "Difference Engine"— and what a difference it made! The engine led to crucial advances in machine tools and engineering techniques which affected the development of precision engineering.

In 1834, he began work on a new project, the Analytical Engines—precursors of the modern computer which the author calls "one of the great intellectual achievements in the history of mankind." Despite the ridicule of many of his associates, the Analytical Engines would keep Babbage, then 43, enthralled for the rest of his life.

Common to the Analytical Engine and the computer are: the separate store for holding numbers and mill for working on them; a distinct control or operations section; punched-card input-output system; and many other features. Babbage's plans, which are included in the book, separated the storehouse holding the numbers from the mill which carried on numerical operations, using numbers brought from the storehouse. The store of an Analytical Engine was formed of a set of axes, upon each of which was placed a pile of toothed wheels. Each wheel was free to rotate independently of the other wheels on the same axis. In the more straightforward designs each axis stored a number, while each wheel on the axis stored a single digit. The toothed wheels were marked on their edges with the figures 0 to 9. Only the top wheel of each axis had a special function, indicating whether the number stored on the axis was positive or negative.

The author points out that most writers assume that Babbage was trying to build the Analytical Engine and that he failed. In fact, says Hyman, Babbage knew he lacked the necessary financial resources. His goal was to carry out experiments and conduct designs because, "with the bitter experience he faced in securing government support for the relatively straightforward first Difference Engine, he had no illusions about the problems in financing one of his far more ambitious new engines ... the intrinsic interest of the research would have to be its own justification."

Charles Babbage: Pioneer of the Computer is not light reading. The book offers a comprehensive look at Babbage's personal and professional life, using many letters and other records previously unavailable. The author explains in great detail, using charts and photographs, every facet of the various engines — including a copy of the original sketch of Babbage's workplace.

For readers interested in an in-depth look at the man known as the "the great ancestral figure of computing," Hyman's book is a virtual encyclopedia of information.

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CP/M AUDIO LESSONS

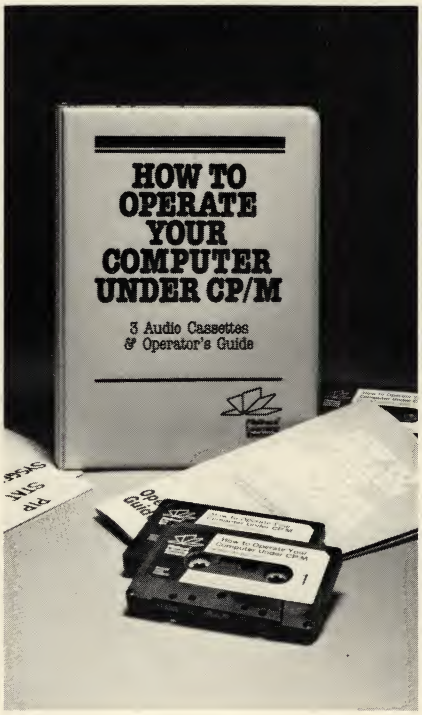
Microcomputer users can now learn by doing—and not just by reading—how to operate any computer that uses the powerful CP/M operating system. *How to Operate Your Computer Under CP/M* is a new course from FlipTrack Learning Systems that presents in about six hours what might normally take weeks or months to learn from manuals.

In just three audio cassette lessons of about two hours each, the learner is carefully guided through the most common CP/M commands for formatting and copying diskettes, copying and erasing individual files, creating and editing documents and using batch processing to run a series of application programs. No programming or previous computer experience is assumed.

The lessons are generic in the sense that they will support any computer capable of running Digital Research's widely distributed CP/M operating system.

How to Operate Your Computer Under CP/M is designed for personal instruction and is availed with three spoken voice cassettes and a printed Operator's Guide for $49.95.

For further information contact FlipTrack Learning Systems, a division of Mosaic Media, Inc., 526 N. Main St., Box 711, Glen Ellyn, IL 60137.


HOW TO OPERATE YOUR COMPUTER UNDER CP/M
3 Audio Cassettes & Operator's Guide
How to Operate Your Computer Under CP/M

SOLVING THE MYSTERIES OF SCIENCE

Following more than a year of development effort, Visual Materials, Inc. has scheduled introduction of *Solving the Mysteries of Science*, a mastery learning science program, for classroom use with the Apple II and Apple II E microcomputers.

Written primarily for students in grades seven to nine, the materials fill significant needs at the high school level as well. All materials are textbook correlated and are based substantially upon classroom prove VMI print materials used successfully in thousands of classrooms since 1979.

The series is designed and written for independent study without need for teacher supervision. Any of the 240 programs may be purchased individually, one lesson at a time, or may be purchased as complete sets of 24 lesson programs for each of the ten science subjects offered.

For further information contact Visual Materials, Inc., 4170 Grove Ave., Gurnee, IL 60031.

SUPER ISOLATOR

Does your computer sometimes suffer from glitches, memory loss or power line spikes and surges? Electronic Specialists, Inc. has a remedy that may be more effective than taking two aspirin and calling for help in the morning.

The Model ISO-11 Super Isolator is designed to protect software from severe electrical problems and features two individually dual-Pi filtered AC socket banks (six sockets total). In addition, heavy-duty spike/surge suppression is incorporated in the design so that equipment interactions are eliminated, disruptive or damaging line spikes and hash are controlled and programs operate more smoothly.

The unit sells for $115.95. For further information contact Electronic Specialists, Inc., 171 S. Main St., P.O. Box 389, Natick, MA 01760.

NEW TI INTERFACE FROM CORVUS

A new interface that will allow users of the Texas Instruments Professional Computer to hook up to a Corvus Omninet local area computer network will be available in June.

Retailing for $495, the interface will offer users sharing of expensive peripherals such as mass storage devices and printers, interactive communications and simple, low-cost connection to as many as 63 other microcomputers or peripheral devices. This could prove especially useful in an office, where Omninet can link several units in a department or serve all the computational needs of a small business.

For additional information contact Corvus Systems, Inc., 2029 O'Toole Ave., San Jose, CA 95131.

LAST NIGHT, COMPUSERVE TURNED THIS COMPUTER INTO A TRAVEL AGENT FOR JENNIE, A STOCK ANALYST FOR RALPH, AND NOW, IT'S SENDING HERBIE TO ANOTHER GALAXY.

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Bulletin Board Systems contain interesting, informative messages from users in your area, and systems outside your local calling area can be accessed for the price of a long-distance call [services such as Sprint (tm) or MCI Omni-call (tm) can be used].

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Industry Watch

COINS

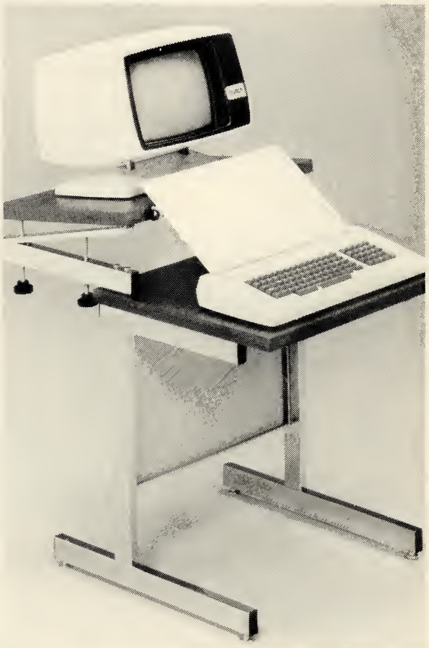
One of the oldest American hobbies, coin collecting, has joined forces with the one of the newest American hobbies, home computers. Compu-Quote has created a sophisticated computer program for coin collectors called COINS, short for Computerized Inventory System.

The program enables the collector to enter information on the coins in his collection as well as produce various printed reports which can be used for personal investment and tax purposes. The strongest future of the program is the value file of information and market prices on 1600 of the most common U.S. coins in all grades. This information is updated and distributed on a quarterly basis and provides for automatic re-evaluation of the collection.

COINS is now available for the IBM Personal Computer and has previously been released in a version for the TRS-80 Models I and III. Minimum hardware requirements are 64K, two disk drives and a printer.

The program is priced at $95, which includes the latest value file. Quarterly updates are priced at $25 each.

For information contact Compu-Quote, 6914 Berquist Ave., Canoga Park, CA 91307.



ATLANTIC DATAFURNITURE

An adjustable, two-tiered CRT station is available for $340 from Atlantic Datafurniture Products.

Connecting cables may be inserted between the levels for ease of installation. The adjusting mechanism tilts and allows the surface to be raised from 29″ to 34″.

For information contact Atlantic Datafurniture Products, Inc., P.O. Box 151777,4507 W. Alva Ave., Tampa, FL 33614.

BASIC TUTOR

SuperSoft, Inc. has entered the growing field of computer aided instruction with the release of Basic Tutor, a computerized self-instructional course which teaches the user to program in BASIC.

Basic Tutor is understandable to persons with no computer background and contains graphic illustrations, frequent summaries and a supplemental printed manual.

It is available for use on the Apple II+, Apple IIe and the IBM PC.

For further information contact SuperSoft, 1713 S. Neil St., P.O. Box 1628, Champaign, IL 61820.

VIDEX INTERFACE CARD

Videx has released its newest peripheral for the Apple II Plus and the Apple II E, the PSIO Dual Function Interface Card. A different interface card for each peripheral is no longer necessary with this dual function board.

A printer and modem, or any other combination of parallel/serial peripherals, can be individually connected to and controlled by the PSIO. The new board is completely compatible with BASIC, Pascal and CP/M operating systems and includes a non-volatile RAM that remembers baud rate configurations and software selectable configuration options.

The unit sells for $229. For further information contact Videx, Inc., 897 NW Grant Ave., Corvallis, OR 97330.

AUTO DIAL 212A

A new 300/1200 baud auto-dial modem from U.S. Robotics, Inc. incorporates a significant advance through extraordinary economy in microprocessor design. This simple design achieves a number of sophisticated features while using only about one-sixth the circuitry of other similar modems.

The Auto Dial 212A automatically dial/answers and transmits at 300 or 1200 baud, operates at full or half duplex and contains an audible phone line signal monitoring system. The Auto Dial's complete self-test system, in conjunction with a system of multiple dip switches, permits any user to install and adapt the Auto Dial modem to virtually any computer or terminal without technical experience.

For further information contact U.S. Robotics, Inc., 1123 W. Washington Blvd., Chicago, IL 60607.

SOFTWARE FITNESS PROGRAM

Open Systems, Inc. has developed the Software Fitness Program™, accounting applications under Microsoft's MS-DOS operating system and IBM Corp.'s PC-DOS operating system.

The Software Fitness Program is a set of proven, fully interactive accounting applications. Included are Accounts Receivable with Billing and Sales Analysis, Accounts Payable, General Ledger, Inventory, Payroll, Sales Order Processing and Job Cost.

The applications are written in Business BASIC. For further information contact Open Systems, Inc., 430 Oak Grove, Minneapolis, MN 55403.

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PAIR-A-DICE

It may not look like snake eyes to an experienced tosser of the dice, but the electronic cube, Pair-A-Dice, can be used in a standard dice game or as an accessory for any game which uses dice as a playing piece.

As random as conventional dice, Pair-A-Dice is an instant response dice that shows a large, red-lighted point display with the slightest movement. In addition to speeding up games' action, this electronic device prevents misrolls or mistakes associated with regular dice.

It is battery-operated and will constantly change numbers as long as the cube is in motion. Pair-A-Dice retails for $29.95 and can be ordered from Syncro Corp., P.O. Box 589, Arab, AL 35016.

COMING IN THE JUNE ISSUE OF TODAY

Networking
TODAY examines the social, technical and practical applications aspects of networking. Also included will be a special report on local area networks.

Electronic Messaging
A look at electronic-originated messaging and mail, and the new ECOM system.

Networking With WordStar
A practical guide to off-line preparation of word files using WordStar.

West German Videotex

continued from pg. 7

capability becomes a cost-efficient alternative to the traditional form of print and direct mail.

To help meet the new marketing challenges presented to the traditonal print, radio, or TV advertiser, a number of ad agencies have opened facilities to create the pages on display and for use on Bildschirmtext. Among these are the West German branches of McCann-Erickson and BBDO International. BBDO, for example, designed pages for a department store that advertised specials and sales of the week in addition to the direct marketing of a travel package; a food manufacturer that direct marketed cook books as well as provided a database of menu ideas; and a bank that listed a real estate database describing properties with detailed floor-plans via line drawings.

BBDO is now gearing up for full Bildschirmtext implementation along with other major ad agencies. New marketing techniques have to be implemented as advertising is shaped for the new data and graphics medium. It is in regard to this latter aspect that particular note must be made about Bildschirmtext. Originally operational on the British Prestel standard, the full service to be implemented this year will be based on the new pan-European CEPT standard. As such, it will be the first European videotex system to be developed on CEPT.

Next month: The CEPT standard.

R.C. Morse is owner of Internationally Syndicated Information Services in New York.

Scott Adams

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questions that should allow him to brag a little about his accomplishments, he demures. As one of his employees noted recently, "I think you'll find Scott doesn't affect the pretense which some of his counterparts suffer from."

Still, many of his colleagues in the industry will tell you — now that Adventure International lives up to its name, with distribution throughout the world, Adams has become one of the microcomputer community's first citizens, often giving a helping hand to others coming along.

For example, Bob Snapp, whose Cincinnati-based Snappware company produces highly regarded utility programs for the TRS-80, tells how Scott Adams came to endorse Bob's products in Snappware's monthly magazine ads.

"In the early days, we got an 'out of the blue' call from AI, ordering one of our first enhancement packages for the Model II BASIC. A few months later, I had the opportunity to meet Scott at a show in Dallas and he was extremely kind with his praise for the packages and we became friends.

"I started using him as a beta-test site for new products," Snapp said, "because I felt he was a serious user and could provide me with better than average feedback. In fact, Scott has discovered at least one elusive bug in one of our products."

When Snapp approached Adams about making a personal endorsement of Snappware in the monthly ads, he had no second thoughts.

And the TRS-80 community hasn't ignored Adams' contributions either. 80 Micro, the foremost monthly magazine for TRS-80 users, recently started an annual "hall of fame" and Scott Adams and *Adventureland* were among the first inductees.

"There can be no doubt," said the 80 Micro editors, "about the impact adventure games have had on the TRS-80 world. They are often among the first programs novices use. . . . In addition, they have also provided many computerphobes with a painless and pleasurable introduction to computers."

In addition, Adams has led his company into broadening the number of computers supported, and many of the early Scott Adams programs are now being translated to run on machines by Atari and Apple. This means a new creative endeavor for Scott — adding high-resolution graphics to many of the Adams classics.

With all this, does that mean Scott will be too busy to create new adventures? Now that he's reached an even dozen, is he going to leave us by ourselves to fend off the dreaded purple worms of the world?

"I certainly hope not," Adams said. "I don't plan to stop writing. I've still got lots of good ideas for new games. Right now, it's more of a time factor." But he promises the saga will continue.

Charles Bowen is a newspaper editor and free-lance writer from Huntington, W.Va.

J. Stewart Schneider is an attorney and free-lance writer from Ashland, Ky.

THE ULTIMATE COMPUTER CONFLICT

MegaWars, an interactive space battle between the forces of the Colonists and the Kryon Empire. Join an intergalactic shootout with up to ten starship commanders transmitting orders from the keyboard cockpits of their craft anywhere in the U.S. Attacking, evading, scanning, communicating. That's MegaWars. Easy to learn but difficult to master. And MegaWars is just one of the many classic puzzlers, sports, adventure and space games you can play on CompuServe. A 24″ × 38″ full color MegaWars poster is available at a special $4.95 price. To order through the CompuServe Information Service, GO CIS-4 and Feedback — or send a check or money order to the address below.

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